STABLE MANAGEMENT
&
A FEW OF DISEASES
OF HORSES IN INDIA

ADAMS

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PREFACE.

I am induced to republish these original papers, of interest to all horse owners, as they originally appeared in Journals, not having a general circulation, and I have often been asked for them, by friends who had been unable to obtain a copy. These papers require no preface and I need only say that they have not been hastily written, but I have given all subjects due consideration and they are the results of extended experience.

Remount Depôt,
January 1st, 1887.

W. S. A.

1st PAPER

ON PRESERVATION OF THE HEALTH OF HORSES BY DUE REGULATION OF THE GRAIN AND FORAGE RATION, AND OF EXERCISE, &c.

(This paper appeared in the Journal of the U. S. I. of India, August 1886).

THE daily ration of grain for Government horses is fixed at 10 lbs. per horse per diem. This, if the horses are in work, is at no time too much, but we know that, for the months of the hot season, the horses barely get exercise, and it is at this time that the feed should be altered. I use the word "altered" advisedly, for, although I would reduce the grain ration, I would at the same time increase the forage ration, for at this season the grass-cutter's grass is very poor, and contains a mininum of nutrition; if the grain be reduced without proportionately increasing the forage ration, or giving an equivalent of bran, the horses would fall off and be unfitted for the work of the drill season. I will first note some of the ill-effects of over-feeding and under-working. There are two well known maxims, which will not be contradicted by any horse-owners :—

1*st.*—You cannot work a horse unless you feed him.

2*nd.*—You cannot feed a horse unless you work him.

It is impossible to lay down in an arbitrary manner the amount of nutrition on which a body of horses can be kept in health and condition, for there are so many circumstances to be considered in individual cases. It is necessary perhaps to lay down a fixed ration for all horses alike, as is the ration for soldiers; but men are capable of reasonably judging for themselves if they find this too much or too little; many leave a portion of their rations whilst others feel obliged to supplement it. With horses this must be done by those in charge, who can, by constant observation of the horses, see what alteration in their ration would be beneficial. All horses cannot be indiscriminately treated without injury being caused to some. At the Remount Depôt, Oossoor, there is no fixed ration of grain for all horses, but they are treated individually as far as possible, and the ration is altered at the discretion of the Commanding Officer and the Veterinary Surgeon. This is as it should be, and that the system is advantageous is, I think, shown by the general health of the horses, which will compare favorably with other stations in the Presidency. Our great aim must be to endeavour to keep up the equilibrium of waste and supply, bearing in mind that any deviation therefrom renders either an unhealthy state of the blood or absolutely causes disease. Any excess of nutrition which cannot be digested is not only wasted but is absolutely injurious, causing diarrhœa, &c., and when by animals of strong digestive powers more nutritive principles are taken into the system than are required, either undue fat is produced, or the blood is rendered too highly charged with nitrogenous matter becoming what is called "too rich," thus rendering the horses more liable to the infection of zymotic diseases, such as "anthrax."

I will here quote a para. from a most interesting and instructive article by Dr. Carpenter on "the Germ Theory of Disease," published in the *Nineteenth Century* :—

"All predisposing causes of epidemic diseases may be generalised " under one expression, the accumulation of decomposing nitro- " genous matter in the blood, either from its introduction from " without (foul air, impure water, or putrescent food), or its " excessive generation within the body, or by obstructive elimi- " nation of the normal waste such as results from bad ventilation " or the misuse of alcoholic liquors. Zymotic poisons which have " no action on pure blood will, by seizing on this appropriate " pabulum, increase and multiply in it."

What is here described as the appropriate "pabulum" is blood surcharged with nitrogenous matter. This state is brought about by three chief means :—

1st.—By over-feeding and under-working.

2nd.—By causing an unusual waste of tissue by giving unusual work to horses not in condition.

3rd.—By neglect of sanitary precautions.

The Committee on Anthrax which assembled at Bangalore in 1884 quoted, the above as a possible explanation of the immunity from anthrax of the hack gharry horses in Bangalore, whilst the Government horses suffered so severely from that disease in the same station.

The Committee say that the hack gharry horses, from their regular work and short feed, have at no time any excess of nitrogenous matter in the blood ; in fact the supply is barely sufficient to replace the expenditure caused by the work exacted from them ; the blood is therefore never in that state described by Dr. Carpenter as an "appropriate pabulum" for the reception of zymotic poisons. There is never any great waste of tissue, for the horses are generally lean, and have but little or no superfluous tissue. Mr. Abraham informed the Committee that the large number of horses which he keeps for hack purposes have *never at any time been affected with anthrax*, but that he had lost a fine pair of walers in his own stable. He attributed the loss of his private horses to the fact of their *having been pampered*. Mr. Abraham was probably unaware of the reason, but his explanation is very possibly correct. If we take the term "pampered" to mean over-fed and under-worked, we have at once a reason for the horses being in that condition of blood in which it would contain an excess of nitrogenous matter, rendering them, as shown above, more liable to the infection of anthrax poison. From this inference we may learn much, and I think that by modification of our system of feeding and exercising our troop horses, we may be enabled, by keeping them in a purer state of blood, to lessen the mortality from anthrax. It is not, however, only the special disease, anthrax, to which horses are rendered more liable by errors in feeding, &c.; there is also the troublesome disease of the skin to which horses in India are liable, and which I have long since considered to be a dietetic disease rather than due to climatic causes, also the frequent abdominal diseases and disorder of the liver. The number of these cases may, I am of opinion, be reduced to a minimum by careful attention to the *individual* diet of the horses. In order to carry out this individual treatment, there are many considerations in different cases. A young horse will require more nutrition to develop and strengthen him than a fully grown and matured animal. A horse in reduced condition from hardship or short feed requires to be carefully fed up till he has regained his condition, and will therefore require more nutrition than is necessary to keep up the equilibrium of waste and supply. In regulating the feed of horses which, we will presume, start on equal terms, as to condition, health, &c., it is necessary to enquire into their individual temperament, for what would be sufficient for one horse might perhaps be almost starvation for another, doing almost exactly the same work. The one being of a phlegmatic temperament, although he does all that is required of him, he does no more, and will sometimes come home, after a long morning, shewing little signs of fatigue, whilst his fellow may be a horse of a highly nervous disposition, which frets from the time his harness is put on; and often when the regiment, or battery, moves off, he is in a state of perspiration, and if in draught, he is over eager, taking more than his fair share of work, and in spite of careful handling will return much exhausted. Here we have an instance of two horses, under indentical conditions, that require a totally different system of feeding, yet they both get the regulation allowance of grain and forage, which may be more than is required for one and insufficient for the other. The irritable nervous horse is often a ravenous feeder with a delicate digestion, and is sometimes affected with what may be termed nervous diarrhœa. This horse probably does not require any increase to his grain ration, but would be benefited by an increase to his forage, good hay being preferable. In case of the phlegmatic good doer, if he keeps good condition, and carries a healthy coat, and his excretions are healthy, I would not decrease his grain ration as long as he was at work. Without going scientifically into the chemistry of food, I would remark that it is chiefly on the grain ration that we depend for the supply of the nitrogenous elements of nutrition. All food-grains differ in the quantity and proportion of the elements of nutrition, and their relative value is estimated accordingly. The most general food-grain for horses in India are *chenna* (Bengal gram) and *cooltee* (Madras gram). These grains differ but little in their dietetic qualities. We may therefore in this paper speak generally of the grain ration without reference to the nature of the grain used.

In endeavouring to reduce the regulation of the feed and exercise of horses to a method, it will be well to divide the work exacted from the horses into classes, and I think the following three classes will be sufficient for our purposes :—

1st.—Hard work.
2nd.—Ordinary work.
3rd.—Light work.

Hard work is seldom reached in peace time with Government horses, and in case of the hardship of war the present ration would be found to be barely sufficient. Cab horses in London, which are worked as hard as any horses all the year round, have no fixed ration of oats, but are given an unlimited supply, the owner knowing from experience that the more he can get his horse to consume the more work he will be able to get from him. Here it is to be noted that it is the grain ration that is increased, and not the forage, for a horse eating a full ration of oats will take but little hay or other forage. The condition of "ordinary work" is seldom exceeded with Government horses even during the drill season, and the present ration of 10 lbs. of grain per horse per diem, together with the forage, is ample for the majority of horses; but there may be some which, from size or temperament, require either more grain or forage. This may, I think, usually be arranged by giving some from the feed of horses which may be necessarily thrown out of work.

We now come to the condition of "light work." This, with Government horses, is almost one of rest or quiescence during the hot months. It is during this season that especial attention to the feeding of the horses is required. It is not reasonable to suppose that horses under this condition can receive exactly the same amount of nutrition which has been shown to be sufficient for horses in work without ill effects being produced, for the supply is the same and the waste is reduced to a minimum. A large amount of nutritive material is, therefore, at this season taken into the system which cannot be assimilated, and it produces an unhealthy state of the system, rendering the animals more prone to infectious diseases, and it is at the end of the hot season and commencement of the rains that the troublesome skin disease appears.

Government horses are really, during the hot months in India, "thrown out of work," and acting on the maxim quoted above, "you cannot feed a horse unless you work him," the feed should be reduced and adapted to the altered circumstances. The difficulty here is how to accomplish this and maintain the strength and fitness of the horses. I think that it should be acknowledged that this cannot be done, and the horses should not at this season be called upon to do more than light work. At the approach of the drill season, their feed should be increased and the horses worked up for the more severe work of this season. The call for urgent work is seldom so sudden but that there is time to prepare the horses for it.

At the end of the drill season, the regulation allowance of grain may be reduced from 10 lbs. to 8 lbs., and an equivalent of bran or extra forage given. Bran, sufficient for a large number of horses, is seldom procurable; it is therefore on the forage that we must fall back. During the hot season the grass-cutters' daily grass is at its worst, is small in quantity, and bad in quality, and without any consideration of the reduction of the grain ration itself requires to be supplemented. Some station are favoured in regard to the forage procurable, for instance at Bangalore, where large quantities of superior hay are grown, which may be purchased at about Rs. 30 per ton. Taking the value of gram at 60 lbs. per rupee, this would give to a Battery of Royal Horse Artillery an equivalent of about 500 lbs. of hay in lieu of the reduction in the grain ration. There are other kinds of forage which may be utilised, as Rumma grass, Ragi straw, and Kurbi or the stalks of *cholum* or *jowari*, which however is a coarse feed for horses, and is more suitable for cattle. The same may be said with regard to sugarcane and the rhea grass (*Reana luxurians*) which is too succulent when green, and too coarse when dry for forage for horses. Some stations have especial advantages: green food may be cultivated regimentally or purchased for the horses; the chief are *lucerne* and *guinea* grass; the former is to be preferred, but the latter, cut when young and given green, acts as an excellent alterative.

The system of the supply of grass to horses by grass-cutters is acknowledged to be bad; it is not only injurious to the general health of the horses, but to it have been attributed outbreaks of anthrax; and the serious outbreak of glanders and farcy at St. Thomas' Mount, although not directly traceable to the grass-cutters' grass, is suspected to have been due to that cause. It is certain that a very large percentage of the abdominal diseases are due either to rank or harsh indigestible and dirty grass. I have gone fully into this subject in a paper on "Colic amongst horses in India," which I contributed to the "Quarterly Veterinary Journal," January 1883. I also consider that to the long-continued use of the green grass a great deal of the skin disease in horses is to be attributed. I have also gone fully into this subject in two papers I contributed to the same Journal.

In considering the importance of the forage ration, it must always be borne in mind that, although the grain ration is necessary, unless, in addition to this, a full ration of good forage is not supplied, the horses will not keep condition. This is specially true with regard to walers, which before they reach this country are essentially grass-fed animals. With the system of grass-cutters, it is difficult to ensure a due amount of good grass being brought daily; and, although the strictest supervision may be exercised with regard to the grass-supply, it is almost impossible to prevent a large amount of inferior grass being issued. In the hot season it is dry, coarse, and dirty, often wetted, under the pretence of washing, but really to give additional weight to the bundle. This grass should be first dried and afterwards thoroughly beaten on a tressel to remove dirt. In the rainy season the bundles will often contain much rank quickly-grown stuff, and any that has been long gathered will be found to be in a state of fermentation; this should be rejected, and the remainder dried at least for two days before issue, and then all dirt beaten out of it. It will be gathered from the above remarks that I consider that much sickness amongst the troop horses in India is due to the grass as issued, the chief of which are colic and other abdominal diseases, indigestion, diarrhœa, &c., skin disease, and lastly anthrax.

I have already spoken of colic, &c., and skin disease. Outbreaks of anthrax have been attributed to infection conveyed to horses by means of the grass. It is beyond the scope of this paper to go more fully into the probable sources of the infection of anthrax, but it is necessary here to mention the grass as a probable source, and to endeavour to lessen the chances of infection therefrom. Unless the grass-cutters are more under control, or are provided with preserves, whence they can collect their daily bundles, little can be done. In the anthrax report the majority of cases are shown to occur during the wet months of the year. All rank grass which has the appearance of having been collected on low-lying swampy ground should be rejected, bring grass cut above the ground and not the roots. All grass should be thoroughly dried before being issued. If, however, the infection of anthrax is brought in the grass, under the present system it is impossible not to be running constant risk of infection.

The Anthrax Committee found that, previous to a certain outbreak of anthrax, there had been an unusually large number of cases of colic amongst the horses. The cases may or may not have been connected with the outbreak which followed. When anthrax is prevalent, there are in nearly all instances, *at the same time*, numerous cases of horses being "off feed." I have always considered these cases to be connected with the outbreak; some go so far as to say that these cases are mild types of the disease itself, as in times of cholera amongst men there are usually many cases of simple diarrhœa. By watching horses symptoms of ill health may early be discovered, and possibly by making some alteration in the stable management serious disease may be averted. One particular lot of horses may be observed to be out of condition, to have an unusually large number of cases of skin disease, or to have delicate appetites, or to be frequent subjects of diarrhœa or colic. The stable management of this particular troop, sub-division or stable, should be enquired into in every way. The sanitation, grooming and exercising should all be looked to as well as the feeding.

I have not dwelt on the amount of exercise necessary for the maintenance of the health of horses out of work, as this is a matter which must be left to the discretion of those in charge of the horses; but a full hour's exercise at a walk in the morning, and half an hour in the evening, would be sufficient in most cases.

Salt should be given to horses as *an article of diet*, at the rate of half an ounce per horse per diem, two drams in the morning and evening feed, and we should not wait till the horses are out of health, or disease is prevalent in the neighbourhood. Salt is an alterative tonic, and a stimulant to the appetite as well as a vermifuge; it has also a special action on the blood, assisting in the solution and elimination of nitrogenous matter; it may therefore be called "a blood purifier."

In conclusion, we may summarise from the above the following practical conclusions:—

1*st*.—In order to keep horses in health by the regulation of their food, it is primarily necessary *to treat them individually*.

This I look upon as almost the pith of the whole matter.

2*nd*.—That their food must be regulated according to the work exacted from them.

3rd.—That the due regulation of the grain and forage ration during the hot months is of the utmost importance.

It is impossible to lay down the amount of grain which may be taken from horses during the hot weather, and what quantity of forage may be substituted. There are so many considerations which must necessarily be left to those in charge of the horses. It is impossible and would not be advisable to keep our horses in condition of racehorses, nor do we wish to see them like the hack gharry horses; but there is a happy medium which should be aimed at, which is perfectly consistent with health. The usual ration of gram for non-working horses at the Remount Depôt, Oossoor, is 6 lbs., and we find that this, with a full ration of forage, is ample; horses not only keep their condition, but improve on it. This ration is increased to 9 lbs. as soon as the horse is put to any work. I would, therefore, put 6 lbs. of gram as *the minimum* to be given to any horse, and I expect it will be found that in the service unless there are exceptional advantages with regard to the forage-supply, that few horses will do well on so small a quantity.

The reduction of the grain ration, in the hot months, from 10 lbs. to 8 lbs., may be taken as the standard, but there may be exceptional cases in which it would not be prudent to reduce even this much, and others from which more might be taken.

I have throughout this paper spoken of the grain ration in lbs. of dry grain, for although 10 lbs. of dry *cooltee* becomes about 22 lbs. when boiled, it is still but 10 lbs. of nutrition. I have endeavoured in this paper to speak in as practical a manner as possible, avoiding technicalities. I have, however, been obliged, in order to make my reasons plain, lightly to touch on scientific ground. I would refer any one wishing to go more deeply into the subject to an exhaustive and most instructive article on Veterinary Hygiene by V. S. F. Smith now published in the *Quarterly Veterinary Journal.*

REMOUNT DEPÔT,
OOSSOOR,
April, 1885.

SKIN DISEASE OF THE HORSE IN INDIA.—(2ND PAPER.)

Reprinted from the Q. J. V. S. I., October 1882.

THE most common form of skin disease in the horse met with in India is that termed by some "Prurigo," by others "Eczema." It is well known to all veterinary surgeons and others in charge of horses in this country. It causes great irritation to the affected horse, loss of hair, corrugation and thickening of the skin. The disease most frequently occurs on the sides of the neck, root of the mane and tail, and in front of the chest; at the same time there is a general unhealthy condition of the coat, and an excessive amount of dandruff is thrown off. The irritation causes the animal to scratch, rub and bite himself on every opportunity, causing a serous exudation, additional thickening of the cuticle and sores on the affected parts.

As there is still a difference of opinion as to the true nature of the affection, I shall in this paper simply use the term "skin disease," and it will be understood that I allude to the special disease of the horse above described.

Some years ago it was suggested to me that the disease might be due to the presence of a fungus. I then examined microscopically numerous specimens of hair and dandruff from affected horses but failed to detect any trace of fungoid growth; and about 2 years ago my attention being directed to the subject by an article in the *Veterinary Journal,* I again examined several specimens, but with negative results. From long experience and study of individual cases, I have formed an opinion which probably will not be concurred in by many, and my mode of treatment may not at once commend itself.

I am satisfied that this "skin disease" is not simply a local affection of the skin itself, but that it is essentially a constitutional disease caused by a morbid condition of the blood; and I am also of opinion that it is a dietetic disease, rather than climatic. Having come to this conclusion, I have sought for some cause in the general feeding of troop-horses in this country, which might tend to cause the morbid condition of the blood and produce skin disease. In reading various works on disease of the skin, I found that food containing saccharine and starchy matter was recommended to be avoided; on this I came to the conclusion that in the continued and almost entire use of green forage for troop-horses we had a probable source of "skin disease."

Having had experience in most of the principal stations in the Madras Presidency, I remarked that I had seen more of this "skin disease" at Kamptee and Bangalore and least at Bellary.

forage is very green and succulent, whereas at Bellary the rainfall is small, and the supply of green forage very scanty.

Fresh landed walers rarely become affected till the second year after their arrival in this country. Two years ago there was an exceptionally large number of horses affected with "skin-disease" at the Remount Depôt, all the cases occurring amongst the horses that had been more than one season at the depôt. In that season there was an unusually large amount of green forage issued. Some *Reana luxurians* had also been grown experimentally, and this was cut young and given green mixed with the forage; it was very succulent and sweet and much liked by the horses; it was however discontinued, not being a suitable forage for them.

I took this opportunity to test the result of stopping all green food and putting the affected horses on Hariali hay. I attended particularly to the grooming and to the general health and gave each a sweat twice a week in clothing, carefully drying and rubbing them down directly they came in. I at the same time gave various internal remedies, and used different external applications as recommended by several authorities, and to one, the worst case of all, I gave no medicine. All these cases did remarkably well and went to the service with sleek coats; the case to which I gave no medicine, but depended solely on the dry feeding and diaphoresis, did as well as the others. Since that time I have had several cases and have treated them with success, following the same simple plan of treatment.

If results are looked for in a short time, disappointment and doubt as to the efficacy of the treatment will necessarily follow as alterations in the system by means of dietetic treatment can only be very gradual, therefore long-continued perseverance with the change of food is necessary.

The improvement is slow, in the majority of cases the skin gradually becomes softer, the hair commences to grow upon the parts that have been devoid of it, and the general appearance of the horse improves, but it may be months before the irritability of the skin subsides.

Prior to trying this plan of treatment I had never heard it recommended, but on my mentioning it to Mr. Western, Veterinary Surgeon to the Body Guard, Madras, he informed me that it was his practice in cases of skin disease, no matter what other treatment he might adopt, to "stop all green forage," and I find a paragraph in the *Veterinary Journal* for November 1878, in which an answer to a query about a cart mare troubled with irritability of the skin by the Veterinary Editor of the *North British Agriculturist* is quoted; the recommendation here is firstly "to stop all green food."

The Mysore Silladars feed their horses almost entirely on Ragi straw; and skin disease is almost unknown amongst them; this is remarkable as a regiment is always quartered in Bangalore in which station skin disease is very prevalent amongst troop-horses. Again, the horses of the Regiments of Cavalry and Batteries of Artilleryof the Hyderabad Contingent are, I believe fed almost entirely on dry Rumma grass. These horses are remarkably free from skin disease, at the same time the disease is common amongst the Regiment and Battery horses at Secunderabad, and it is noteworthy that the Hyderabad Contingent horses at Bolarum are picketed in open lines, and the Royal Artillery horses are under cover.

I could quote individual cases to show that the continued use of green succulent forage is in many instances a predisposing cause of skin-disease in the horse in this country. Of course I do not wish it to be understood that all horses fed on green grass necessarily get "skin-disease;" but I am of opinion that some horses have a constitutional tendency to the disease, and that the continued use of green forage acts in these cases as a predisposing cause by producing an alteration in the blood, and I think that the injurious effect is probably due to the saccharine matter contained in the grass, which, by process of drying or making hay, would be decomposed by fermentation.

With regard to the amount of drying that would be sufficient to counteract the injurous effect of giving solely and continuously green forage to horses liable to skin-disease, (I would prefer of course to give a forage ration entirely of Hariali hay, but this is probably impracticable), I would recommend that the grass-cutters' grass be dried for two or three days before its issues to the horses. I would further advise that the forage ration should at no time, especially during the wet season, consist solely of fresh grass-cutters' grass, but always contain a proportion of Hariali hay or dry Rumma grass as procurable.

I would here remark that I have in many cases observed that horses affected with skin-disease are also the subjects of brittle feet. This is to be accounted for by the fact of the horn being a dependency of the skin; that structure being itself unhealthy, the secretion of the horn becomes so too. These brittle hoofs may be softened by the application of hoof dressings, yet, as long as the skin-disease exists, there will be no permanent improvement; however, as the state of the skin improves, so will the secretion of the horn become more healthy.

It now only remains for me to speak of local applications to the skin. The Pharmacopœia has been ransacked for remedies. I myself have at various times used almost every conceivable agent with doubtful success. I have of late discarded all oleaginous compounds, as I have come to the conclusion that whatever may be their therapeutic effect, they act prejudicially, particularly with horses picketed in open lines by collecting dirt and thus mechanically interfering with the healthy action of the skin. It is my practice at first to thoroughly cleanse the parts affected by washing with carbolic acid soap. Subsequently, if there is much irritation present, I apply the cyanide of potassium lotion as recommended by Professor Williams in his treatment for "Prurigo" in page 683 of his work on Veterinary Surgery. As I said before, I give affected horses a sweat twice a week to promote a healthy action of the skin, and I also wash them twice weekly with carbolic acid soap to thoroughly cleanse the skin from all impurities, and any exudation that may have taken place. Certain special cases may require some modification in the treatment, but I need not go into that, as in this paper I have only wished to speak of skin-disease generally.

2ND ON SKIN DISEASE OF THE HORSE IN INDIA.—(3RD PAPER.)

Reprinted from the Q. J. V. S. I., Oct. 1883.

It is now twelve months since I sent a short paper on this subject to the QUATERLY JOURNAL. I then gave it as my opinion that a large proportion of the usual skin-disease amongst horses in this country was attributable to the inordinate use of green food. Since that time I have continued the same simple plan of treatment as described in that paper with uniform success. I came to the conclusion that it was dietetic rather than climatic disease, and that it was a constitutional rather than a local affection of the skin, and further experience has confirmed me in this opinion.

I am not satified as to the mode in which the green grass exercises its injurious effect; it has been suggested to me that it is simply on account of the excess of water in the food, but I am still of opinion that the ill-effect is due to saccharine matter which would become altered in the process of drying or making into hay.

I fear I have failed to make myself understood in some instances; it is not the *occasional* use of the green food that is, I think, injurious, but it is the *long continued* use of green grass such as the grass-cutters bring, so that sometimes for months together the horses get little else but green grass. Where horses are continually on dry food, an occasional full ration of green food, doubtless, has a salutary effect by acting as an alterative to the system. I have been told I have not proved that green food is productive of skin-disease. I have however shown that, in the stations in which there is a more abundant supply of green food, there is more skin-disease amongst the horses, and *vice versâ*. I have quoted a fact that at the Remount Depôt, where we get but little skin-disease, at a time when an extra amount of green food was issued, there was an unusual number of cases, and with the stoppage of its issue the cases improved.

We have now at the Remount Depôt seven farm horses, which were received from a Battery of Royal Horse Artillery, which went home from Baugalore. These horses when they were received were almost hairless and in a terrible state of irritation. I have kept them continually on dried grass and hay. I have however dispensed with the occasional sweating, which I considered unnecessary as the horses are in continual work. They now carry sleek coats. I attribute this improvement *entirely* to the effect of dry feeding; it cannot here be said that it is due to better grooming, for it is impossible with our strength of horse-keepers and limited supervision to ensure strict attention to grooming as in a Regiment or Battery.

I have received from private sources the following facts which are illustrative of the beneficial effect of dry feeding on skin-disease in horses. Veterinary Surgeon Going informs me that when he was stationed at Secunderabad in charge of two Batteries of Royal Artillery, there were about 20 cases of skin-disease amongst the horses in each Battery; he suggested that they should try the effect of dry feeding as recommended by me. The Commanding Officer of one Battery agreed, but the Commanding Officer of the other Battery would make no change, the result was that after six months the Battery that gave the dried grass had but *one bad* case and *three mild* cases, whilst the other Battery, which had continued the green grass, had no less than *twenty-six bad* cases and *nine mild*. This is most remarkable as the horses of the two Batteries were in stables adjacent the one to the other, and were under exactly the same conditions, with the exception of the condition of the grass when issued—in one Battery it being given in a dried state and in the other it was given green as it brought in by the grass-cutters. This illustrates both sides to the question: firstly, the beneficial effect of dry feeding; secondly, the injurious effect of the green grass, for the number of cases of skin-disease amongst the horses of the Battery which continued the use of green grass absolutely increased, whilst the other Battery which gave their horses dried grass was nearly free from skin-disease.

Veterinary Surgeon J. Mills informs me that he had a pair of ponies; they were in poor condition, but carried good coats; he gave them almost unlimited green *guinea* grass; in a short time one became affected with very irritable skin-disease. This is a case strongly presumptive of the disease having been absolutely caused by green food, as *guinea* grass is very rich in saccharine matter. In my original paper I quoted V. S. Western's opinion on this subject as corroborative of my own. He further added that he owned a horse which was always affected with disease of the skin after getting green food, but improved when put on dried grass or hay.

I would here direct attention to an interesting fact, related by V. S. D. C. Pallin, in the first number of the Quarterly Journal. He informs us that, during the voyage to the Cape, horses which embarked with chronic skin-disease quite recovered; he attributes this to "influence of climate," for he says in his conclusions: "The influence of climate on this disease is well illustrated by the fact that it disappears at sea, and certainly assumes a milder form at Secunderabad than at Bangalore." Now both these facts strongly support my views as to the causation, for at sea the horses could have received nothing but dry food, and at Secunderabad there is far less green food than at Bangalore.

I could multiply these instances in support of my experience, but it would unnecessarily prolong this paper, and I think I have given sufficient evidence to maintain my previously expressed opinion. I have at no time wished dogmatically to lay down that skin-disease amongst horses in India is entirely due to the excess use of green food. Were it so we might at once classify skin-disease amongst "preventible diseases." That there are other factors in its causation cannot be denied, for, doubtless, exposure, neglect, indigestion, and disorder of the liver, all play a part. I think, however, I have shown beyond doubt that the prolonged use of green food has a most marked effect and that the change to dry food is most beneficial.

As to the exact pathology, I consider that it is "Eczema" in a chronic form. By some it is termed "Prurigo," which I look on as a totally different affection, but one that is frequently met with, especially amongst young ill-conditioned horses.

ON A SPECIAL DISEASE OF THE SKIN OF THE HORSE TERMED "PITYRIASIS."—(4TH PAPER.)

Reprinted from the Q. J. V. S. I., October 1885.

THE case which I wish to bring to notice occurred in a horse which was standing in the sick-lines for observation, having been reported to have protruded a portion of the rectum when passing fæces; this proved to be a bladder-like fold of the mucous membrane which was eventually permanently protruded from the anus. It appeared to me like an hydatid cyst, I punctured it and evacuated a quantity of aqueous fluid.

Subsequently the horse was observed to have an eruption throughout the whole of the surface of the skin, from the coronets to the muzzle; this eruption was most marked about the head and extremities. The disease gradually progressed, the skin became hot and very sensitive, great irritation was present and the slightest rub or abrasion caused a sore. The limbs became œdematous, but the most noteworthy feature was enormous desquamation of fine bran-like epithelial scales. The hair came off from the head and other parts of the body and these parts were left quite bare. The urine was very turbid, containing a heavy sediment composed chiefly of Carbonate and Oxalate of Lime.

Treatment.—I at first gave a purgative and then regulated the diet, stopped all green food, reduced the grain ration, and gave additional bran and dry hay. The horse was given a daily sweat in clothing till the œdematous condition of his limbs rendered this impracticable. I therefore now gave him his daily sweat in a vapour bath which we have attached to the sick lines. After these sweats he was always quickly, lightly, and thoroughly rubbed down, blanketed up, and his legs bandaged. Internally I, at first, gave carbolic acid, twenty drops twice daily for a week, and then the liq. arsenicalis for a second week, at the same time I continued the daily diaphoresis by means of the vapour bath, the case improved and the amount of dandruff became less. The œdema of the legs was also reduced, but the hair had nearly all fallen off and the urine continued turbid. The horse was now able to be sweated in clothing as before; I therefore discontinued the vapour bath and gave him a canter every morning, and it is remarkable that on the third day the urine became quite clear. I repeated the carbolic acid for another week, and then again gave the liq. arsenicalis. At a little over a month the horse had quite recovered, all irritation had ceased, there was no more than the healthy desquamation of dandruff, the hair had grown on the parts which had been denuded and he was discharged off the sick report.

Remarks.—The disease "Pityriasis" is not common in horses, I have seen but few well marked cases, it is not mentioned in the Nomenclature of Diseases which is issued for our information. I am guided in my diagnosis by the following extract from Dr. Liveing's Handbook of the Diagnosis of the Diseases of the Skin :—

"Differential Diagnosis :—The recognition of Pityriasis is not difficult—(1) Its universal or nearly universal character. (2) The extreme redness and tenderness of the skin. (3) The excessive exfoliation of thin plates or scales of Epidermis. (4) The absence of infiltration or thickening in the true skin which distinguishes it from "Psoriasis." (5) The absence of any moist exudations which distinguishes it from ordinary Eczema, are characters sufficient for the purpose of diagnosis."

The case just quoted had all the above diagnostic symptoms although of course the redness of the skin could not be detected. The points which are I think noteworthy in this case are—The success attending the very simple line of treatment adopted. The object of which was, 1st—To promote the healthy action of the skin. 2nd—To endeavour to get the blood into as pure a state as possible.

The first was accomplished by the daily diaphoresis by means of exercise in clothing and the vapour bath, and the decided improvement in the urine when the horse was sweated by exercise is very noteworthy as showing that this is as far more efficacious means of acting on the skin than the effect of the vapour bath.

The second object was endeavoured to be attained by due regulation of the diet. I then used the carbolic acid experimentally on account of the action of tar in preventing the conversion of constituents of food into oxalic acid, carbolic acid being the active principle of tar. The arsenic was given on account of its well known tonic and alterative effects.

I have long considered the majority of the non-parasitic skin affections of the horse in India to be general diseases of the system rather than local affections of the skin, and I am strongly of opinion that the cause is generally dietetic. This case I determined to treat on that belief and I used no external application to the skin itself except a little zinc lotion to any parts that had been abraded. Another point of interest is, could the disease of the mucous membrane of the rectum be in any way connected with the subsequent disease of the skin ? It is well known that there is great sympathy between mucous membranes and the skin, and I think in this case the two were probably connected.

ON "COLIC" AMONGST HORSES IN INDIA.—(5TH PAPER.)

Reprinted from the Q. J. V. S. I., January 1883.

ABDOMINAL diseases are common amongst horses in India, therefore the subject must be one of interest to those in charge of Government horses as well as to private horse-owners. An interchange of views and experience on the subject will be beneficial to those interested in the management of horses in this country. I therefore offer this paper on the subject of "Colic amongst horses in India."

All diseases of the horses causing symptoms of abdominal pain are usually reported as "colic". If "colic" may be taken to mean pain in the abdominal viscera, due to some disturbance of the digestive functions, the term may be accepted, and it is this form of abdominal disease of which I wish to write.

I shall not in this paper follow the usual manner of dividing colic into two classes, spasmodic and flatulent, as, although symptoms shewn may differ and special cases may require some modification in the treatment, I am of opinion that the original cause of each class of colic is similar, but in some instances, owing to the nature of the food or peculiar state of the ingesta, as soon as there is any interruption of the digestive process, fermentation takes place and gas is evolved complicating the disease and rendering the restoration of the digestive functions more difficult.

The ordinary symptoms of abdominal pain shewn by the horse, are so well known by all in charge of horses, that it would be superfluous on my part to lengthen this paper by giving a description of them. I will therefore at once proceed to the

CAUSE.—The cause of derangement of the digestive functions may be numerous, but from my experience it is most frequently due to the presence of some irritant in the intestinal canal. The physiological action of irritants in causing colic is of two kinds :—

1st.—An ordinary irritation, which increases the peristaltic movements of the intestines, producing laxation of the bowels or perhaps purgation.

2nd.—An extraordinary irritant causing arrestation of the peristalsis ; I will here quote from Kirke's Physiology, 4th edition, page 268 ; "Violent or other irritation stops the movement apparently by exhausting the nervous influence and thus paralysing the muscular tissue."

Colic caused by the first (or ordinary) irritation to the bowels, is most frequently met with during the rainy season, when the grass-cutters *will* bring some harsh unwholesome grass with their bundles, for they can at this time collect a large quantity of quickly grown stuff with very little labour, and make up their bundles to the specified weight. This grass soon sours and contains a minimum of nutrition. Colic thus produced is usually associated with purgation. In my experience, "colic" is more frequently due to the second cause, that is "violent irritation causing arrestation of the peristaltic movements," and is chiefly caused by coarse and fibrous, or dirty grass, or by the horse himself, from morbid appetite, swallowing quantities of dirt, sand, or gravel.

The coarse, fibrous grass is usually brought by the grass-cutters, during the early rains, when they collect their daily bundles in a short time by following the ploughs, which are then at work breaking up and cleaning the ground. The bundles thus collected are chiefly made up of harsh roots, which have laid in the ground during the hot weather, although, no douht, in these bundles are some of the true Hariali roots, which, when they have grown, are succulent and nutritious, but taken out of the ground at this time are fibrous and indigestible. And with this grass is a very large proportion of the true fibrous roots, in appearance and texture very like *cuscus*, from which tatties are made, and I should think containing as little nutritive matter and about equally indigestible. These bundles are often passed as "root grass," it not being always understood that it is not the true "root" that should be required, but that the underground stems or rhizomes of the Hariali alone, should be passed as "root grass." At this season of the year, the early rains, cases of colic are very numerous, and nearly all are due to this erroneously called "root grass." I have specimens at present in my possession of large masses of harsh roots which had accumulated in the intestines, and which the intestinal action was unable to pass on.

Another frequent cause of colic in this country is the dirty grass sometimes given to horses, a bundle of grass-cutters' grass weighing say from 30 to 40 lbs. often containing as much as from 1 to 2 lbs. dirt, sand, or gravel. Grass-cutters are very properly forbidden to wash their bundles before producing them for inspection. This is right, as there is nothing to prevent them washing them in the most foul pools. However, as the grass, from the manner in which it is gathered, must contain a quantity of dirt, appliances should be at hand for the purpose of cleansing it before its issue. If the grass be dried before being given to the horses, most of the dirt can be beaten or shaken out.

Chenna or cooltee should be thoroughly cleansed from all sand or gravel, but from my experience I do not think, if the grain is cleansed with ordinary care, it is with the gram that the large accumulations of sand and gravel that are sometimes found in the intestines, after death, are taken in. I consider that in the majority of cases, the sand and gravel is either taken in with the grass or eaten wholesale by the horse from morbid appetite. I am aware that this opinion is not generally concurred in, and I have known gram, from a feed of which a few grains of sand and gravel have been extracted by means of careful washing, condemned, and at the same time grass issued that contained quantities of dirt and sand. I admit that it is at all times of the greatest importance that the gram should be free from all impurities, yet I am of opinion that the small amount taken in, in the feed, would be less likely to accumulate in the intestines than that taken in wholesale from morbid appetite or in the quantities I have shewn frequently to be present in the grass-cutters' bundles. With regard to the eating of earth, sand or gravel, from morbid appetite, I think this is of much more frequent occurrence than is usually admitted. In 1877 I sent a communication to the Veterinary Journal (Vol. V., p. 401) giving some of my experiences of sand-eating amongst horses in this country ; as it bears upon this subject, I will refer to the remarkable instances I then quoted. A number of fresh walers were purchased in Madras and sent to the Depôt. Owing to the scarcity of straw for bedding (it was during the great famine) these horses had been given sea-sand to lie on. One horse died on his way to the Depôt and a large quantity of sea-sand was on *post-mortem* examination found in the intestines. Shortly after their arrival several of these horses were admitted into the sick lines, showing symptoms of abdominal pain, at the same time voiding quantities of sand ; one horse died and 21lbs. of sand were found in his colon. There were three other horses placed under treatment for sub-acute enteritis, and before leaving the sick lines, they passed respectively 17½, 9½, and 3¾lbs. of sand. The horses of this batch did not thrive, and from amongst them were frequent cases of colic, usually associated with the passing of sand. The sand was doubtless taken in by these ill-conditioned horses from morbid appetite and probably on account of the salt it contained. The cases above quoted may be exceptional, but are instructive, showing as they do the risk attached to the use of sea sand in lieu of bedding. I have also met with cases of horses bedded with river sand, eating it wholesale and dying of enteritis, large quantities of sand being found in the intestines, *post-mortem.* Instances of horses eating the gravel at their pickets and gnawing the walls of their stalls are in the experience of every one.

I now go on to another generally accepted cause, and that is "Water." My experience is that this is seldom a cause of colic in this country, perhaps the reason of which is, that water, as given to horses in this country, is seldom perfectly cold, and is, I think, usually softer than at home.

In this tropical climate, I think that more harm is often caused by not ensuring horses their full supply of water than by their ever getting more than is sufficient. I have had horses sent to the sick lines refusing feed, not being able to detect anything wrong, I have ordered them to be watered, and the feeds to be put on again in half-an-hour. I have then frequently found them eat it.

It is a generally understood maxim that a horse should not be watered when he is "hot." This is correct, if it is understood that a horse should not be taken to the watering trough in a state of perspiration after exertion, but I have heard it laid down that a horse should not be watered till he is *dry*, the fact being overlooked that, although the coat may not be absolutely dry for some time longer, the horse has ceased to perspire, the system is already cool, and the horse would be refreshed by water. The time for watering is correctly laid down to be about half-an-hour before feeding. To water horses shortly after feeding is contrary to the laws of the physiological action of the digestive system of the horse, for water taken by the horse will pass through the stomach into the intestines, and if the stomach, at the time of watering, contains food, a portion will be carried on into the intestines in an undigested state; it would then act as an irritant and be a probable source of colic. I am informed that it was formerly the custom in this country to water troop-horses at the end of stable hour, after feed, and that the custom is still carried out in some of the irregular troops in the Native States, and no ill-effects are observed. This I do not understand, and, in noticing the practice, I would urge the propriety of always watering before feed. There are doubtless other causes of colic, I may mention the following :—

In wet, cold weather, frequent cases of colic occur amongst horses that are exposed; these require but little treatment, rubbing dry, a warm stall, dry bed and blanket, and perhaps a warm drink being often all that is required.

Cribbiters and windsuckers are notoriously the frequent subjects of colic, the cause being indigestion produced by quantities of air being swallowed and inflating the stomach and intestines, weakening their powers, and temporarily paralysing them.

Some horses, especially ill-conditioned weakly animals, are peculiarly subject to attacks of colic, due to want of tone of the digestive system. These horses require to be carefully fed on good food, easy of digestion, and as the horses gain in strength and condition, they become less liable to the attacks.

Habitually ravenous feeders are also frequently the subjects of colic, swallowing their food before it has been properly masticated and prepared for passage into the stomach. Some horses, also, after eating their full ration of grass, will eat their bed straw, loading the stomach and intestines with a quantity of food not easy of digestion, which, acting as an extraordinary irritant, causes arrestation of the digestive functions.

Over-fed and under-worked horses are the subjects of colic,

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more nutriment being taken into the system than can be assimilated. These cases are usually associated with diarrhœa and offensiveness of the fœces passed.

There are no doubt other causes of colic due to constitutional predisposition or errors in stable management, but I think I have said enough to show my opinion as to the general cause of colic in horses in this country.

I have throughout wished to confine my remarks to the subject of colic as defined by me at the commencement of this paper. I therefore do not intend to go into the untoward sequences of colic, such as enteritis, gastritis, rupture of the stomach or intestines, or rupture of the diaphragm, &c. I will therefore close this paper with a few remarks on the general treatment of colic.

Treatment.—The routine treatment for colic in vogue at the Remount Depôt I had not seen till I came here. The practice was, I believe, introduced by Mr. James Thacker, who was the first Veterinary Surgeon appointed to this Depôt ; its simplicity and success has recommended it to his successors, and it has been continued up to the present time.

When a horse is brought to the sick lines shewing symptoms of abdominal pain, a very copious enema of cold water is administered ; the horse is then walked till he has rejected it ; he is then placed in a large loose box and well bedded down. Usually, in a short time, the symptoms of pain pass off ; if they do not, a second enema is administered. After this, should he continue in pain, the treatment is adapted to the symptoms shewn. It is my practice, should the horse not be relieved after the second enema, to give a laxative dose of linseed oil, with or without the addition of a couple of drachms of aloes according to circumstances.

The success of this mode of treatment is undoubted, and I consider the *modus operandi* is this : The enema first relieves the patient by emptying the rectum of all fœces present, and the cold water acts secondarily as a stimulant to the muscular coats of the intestines, restoring the peristaltic action and inducing the removal of the offending material. Should this not be effected by the enema, the laxative acts in the same manner, and the symptoms of colic pass off, of course, long before any effect of laxation of the bowels is perceptible. Should the patient be violent and show any excessive pain I always give sedatives, and if there is flatulency, I add the tincture of assafœtida. The ordinary stimulating colic draught is seldom given, except in protracted cases, as I think this is often unnecessary, and is therefore wasted. Some special cases may require special treatment, but this is briefly the treatment for colic which I adopt. In cases of colic, the cause should always be looked for, both as a guide to any special treatment that may be required and as to measures to be adopted for the prevention of a recurrence of the attacks.

ON "FILARIA PAPILLOSA" OR "WORM IN THE EYE" OF THE HORSE.—(6TH PAPER.)

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THIS is the well known worm which is often seen in the eye of the horse in India. It is generally described as a parasite whose proper habitat is the eye of the horse; but Dr. Manson does not agree with this; and asserts that the same parasite is also found in the muscles, cellular tissue, membranes of the brain, the thorax, and the abdomen. I have never recognised it in these situations but I can call to mind many instances of having found small entozoa, free in the abdomen or in the mesentery. It is possible therefore that a horse which has a "worm in the eye" is infested with this migratory parasite, and that one has by chance found its way into the globe of the eye, also it must be remembered that possibly horses which have not "worm in the eye" may be infested with the same parasite. This rather widens the subject for enquiry and in order further to investigate this point we will take the description of the Filaria Papillosa given by Gresswell. "The "head is broad; the mouth wide, and surrounded by a ring of "chitine, and possesses two denticles. On the neck are two "papillæ near the median line, besides eight caudal papillæ on "either side. The tail of the male is spirally twisted; the tail of "the female slightly curved. The males are two to three inches "long, the females five to seven inches." With this description at hand and by observations at post mortem examinations we may be able to verify the above statement.

The Filaria Papillosa doubtless finds its way into the interior of the eye of the horse by means of the circulation. It would seem most probable that worm came through the blood vessels when in its mature state although small in size, but a case which recently occured in my practice, seems to point to its reaching the eye in its embryonic state. The case was this, a horse was sent to the sick lines with a white speck in the eye, on examination I found it to be a sort of cyst, like a millet seed, situated in the anterior chamber on the upper and outer part of the iris, but I could not then detect its true nature. Subsequently, on close examination, in a good light, I could detect what appeared to be the extremity of a worm projecting from the cyst. The encysted worm afterwards moved to the lower and inner corner of the eye and there remained. The worm gradually developed and although the cyst disappeared the worm did not seem to be free and had either penetrated the iris or become attached thereto. I hesitated to operate in the usual manner, as I feared the worm would not come away when the aqueous humour was evacuated, but after waiting a week and finding there was no alteration in the worm and the internal structures of the eye were becoming opaque I threw the horse and having put him under chloroform, with a small eye scalpel I made an incision through the cornea at the inner and lower part, over the place where the worm was situated and, as, I anticipated, it did not come away with the aqueous humour but I easily removed it with a pair of fine forceps; a little bleeding was caused but the case did well.

With regard to the source of the parasite, the ova doubtless gain the system by the digestive canal and are taken in probably with the water or green food, some say that cases are most frequent during wet seasons and in damp localities but this has not been my experience. From a record 18 cases which have occurred at this Depôt I find that the numbers in each month are as follows :—January 2, February 4, March 5, April 1, May 3, June 0, July 0, August 0, September 1, October 1, November 1, December 0; Total 18. From this it will be seen that of the 18 cases, no less than 15 occurred in the first five months of the year, during which the total average rainfall is only 8·6 inches or about a quarter of the average total of the year. Eleven cases occurred during the first three months during which the average rainfall is very small, being only 1·8 inches. A curious point, worthy of note, is the frequency of cases of worm in the eye in some years and the total absence in others. In 1871-72 there were two cases, then an interval of three years, during which there was no case. In 1875, 1876, 1877 there were four, then an interval of two years, in 1880 there were three cases, then another interval of two years. Three occurred in 1883, none in 1884, one in 1885, and in the present year, up to date I have had five cases, three in February and two in March. I am informed that an unusual number of cases have also occurred in the adjacent station of Bangalore. As the general system of feeding and watering is the same in each year we must look for something which is especially favorable to the development of this particular parasite in certain years, but until the natural history is exactly known this special favouring influence can only be guessed at. The following fact may here, however, be noted, the months of October, November, and December were unusually wet last year and large number of cases of worm in the eye occurred in the months following.

It has been often generally stated that horses the subject of "worm in the eye" are liable to become weak in the loins, I have never met with a case and the only recorded instance I can find is, that in Mr. Meyrick's work, in which a case is quoted of a horse having a worm in each eye, being also weak in the loins. I have, however, been told the following, which would tend to confirm the belief that the two may be in some way connected. In a stable of five horses two were affected with worm in the eye, and at the same time a third horse in the same stable became weak in the loins. These horses were all under the same circumstances and the source from which the horses got the worm in the eye may perhaps also have been the source of a parasite which found its way to the spinal cord. This is the only way in which the two diseases can be connected.

The worm having once gained the aqueous humour is plainly visible through the cornea. Having once gained the freedom of the aqueous humour it rapidly develops, and cannot get any farther nor can it go back. All that can be done now is to puncture the cornea and the worm will escape with the aqueous humour. The operation is simple and requires but little explanation; although simple, great nicety is required, for a very slight deviation in either the depth or direction of the puncture may cause injury to the iris or other internal structure of the eye.

The OPERATION may be performed without throwing the horse. I have, however, never attempted this, *I invariably throw him and much prefer to have the patient under chloroform.* With regard to the operation itself, I always *operate as soon as possible after the worm is detected* in the anterior chamber, and *make the puncture in any position,* either above or below the pupil, over the worm, there is then but little chance of the worm not escaping with the aqueous humour. I always use a very keen fine lancet and make the puncture by a firm pressure, with the wrist as a fixed point and hold the lancet between the point of the finger and the thumb. I do not like the guarded lancet, but it has the advantage of allowing the knuckles to keep free from the rim of the orbit, which in some cases it is difficult to avoid when holding the lancet between the finger and thumb. *I seldom use the eye speculum,* as I find it only unnecessarily troubles the patient and excites the retractor muscles of the eye rendering the operation more difficult. I choose the position at which I wish to make the puncture and wait my opportunity. As I said above, I prefer to have the patient under chloroform for I am confident that the majority of accidents that have occurred from the operation are due to the unsteadiness of the patient, the slightest movement making a great difference in so delicate an operation. I have had no experience in the use of solution of cocaine for this operation; Mr. Mills reports most favourably on its utility but others say that although the sensation is removed from the eye itself the catilago nictitans and the retractor muscles are not involved in the anasthesia. It is of course always satisfactory to find the worm after the evacuation of the aqueous humour, but sometimes, in spite of the use of the black cloth, the worm is lost, I would look carefully within the lids and upon the surface of the eye, but if it cannot be found, I would take it for granted that it has escaped and release the horse, and after the chambers have again filled, see if the worm is still there, and if it is, a second puncture must be made, this I think would be less liable to do an injury to the eye than any search for the worm after the first puncture had been made and all the parts of the eye in direct apposition. I have, however, only known the one above quoted case in which the worm failed to come away with the aqueous humour, although I have sometimes missed it at the time of operation, but found when the chambers of the eye again filled that the worm was not present. Pressure on the eyeball at the time of operation is recommended by some to assist in the expulsion of the worm, this, however, is quite unnecessary as the retractor muscles afford sufficient pressure.

With regard to the ill-effects produced on the eye by the presence of the worm, I have met with cases in which for several days there has been a general weakness of the eye and an intolerance of light, before the Worm is visible. Opacity of the cornea is a very frequent but not a constant complication, it varies from a mere film to a dense opacity. This is due doubtless to the irritation caused by the presence of the parasite and it is surprising with what rapidity it forms. I can mention a case in point a horse was reported with worm in the eye, one evening, I was not able to see him till dark, when it was too late to operate, the eye was then clear. Early the following morning the cornea was perfectly opaque and the worm scarcely visible, this opacity had therefore taken place in twelve hours, after the removal of the worm, the cause of the irritation, the eye cleared rapidly. Cases occur in which there is no opacity either before or after and I have had a case in which there was dense opacity before the removal of the worm and which never cleared. *The sooner the worm is removed after detection the better,* but sometimes this is not practicable, I know an instance in which the worm had been present for about three weeks before the horse was sent to me, there was no excessive opacity of the cornea but the sight was injured and the humours of the eye were dimmed. I removed the worm and after a short time, sent the horse to the owner who told me that for a long time the eyes appeared dull but eventually quite recovered. After the operation no special treatment is required, but I always keep the patient low, in a dark stall, and with a wet cloth over the eye to endeavour to check any predisposition to inflammation.

ON THE USE OF VALERIAN AS A TONIC FOR THE HORSE.—(7TH PAPER.)

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As this drug is by no means in general use as a tonic for the horse, the following facts with regard to its experimental use will, I trust, be deemed worthy of record. I first made a trial of its effect on a horse which was suffering from persistent " Polyuria " As I sent a record of this case to the Quarterly Journal, I need not repeat the observations in detail here, it will be noted that in this case after a steady loss of flesh and uncertain improvement in the Sp. Gr. of urine, the administration of the Radix Valerianæ was followed by a decided decrease in the quantity of urine passed and a rise in the Sp. Gr., there was at the same time a considerable increase in the weight of the horse.

The second case was that of a horse which was received in very wretched condition and was much exhausted, I treated him with Iron tonics and as I suspected Entozoa I gave various vermifuges. The horse appeared to gain strength but remained very emaciated although he fed well, I decided to try the effect of Valerian on this case, and gave ʒii twice daily with ʒii of Gentian; In order to watch the effect I weighed the horse once a week and the following table shews the effect.

Date.	Weight, lbs.	Gain, lbs.	Loss, lbs.	Remarks.
1884 Jan. 31	764	...	...	Gave Rad. Valet. Rad. Gent. āā ʒii bis die.
Feb. 7	771	7	...	
,, 14	780	9	...	
,, 21	786	6	...	
,, 28	793	7	...	
Mar. 6	784	...	9	Gave Laxative.
,, 13	784	...	...	Repeat Valerian Tonic.
,, 22	788	4	...	
,, 30	798	10	...	
Apl. 6	824	26	...	
,, 13	854	30	...	Discontinue Valerian Tonic.
,, 20	852	...	2	Repeat Valerian Tonic for one week.
,, 27	863	11	...	Discontinue Valerian Tonic.
May 4	835	...	28	Repeat do. do.
11	879	44	...	Continue do. do.
,, 18	863	4	...	Valerian expended.

The points which are noteworthy in this table are the increase in weight whilst the horse was on the Valerian and the decrease when it was stopped.

The third case was one of "Polyuria." The horse had been observed to be falling away and was admitted into the sick lines for observation and was found to be suffering from severe "Polyuria." I changed the diet and gave for one week a tonic of Iodide of Iron and subsequently the Valerian Tonic. The following table shews the weights taken at an interval of a week.

Date.	Weight, lbs.	Gain, lbs.	Loss, lbs.	Remarks.
1884 Apl. 28	854	...	...	Give Iodide of Iron Tonic.
May 5	847	...	7	Give Valerian Tonic.
,, 12	876	29	...	Continue Valerian Tonic.
,, 18	881	5	...	

The improvement as shown by the decrease in quantity and increase of sp. gr of the urine was very marked, as also was the increase in weight. From the above cases I am convinced that we have in Valerian a most valuable tonic for the horse and the cases in which its use appears to be especially indicated are those of "Polyuria" and General Debility or Cachexia in which there is no special diseased state to treat. It is said to be a powerful nerve tonic, and I imagine from the increase of weight shewn to have followed its administration, that it possesses a property of promoting the proper assimilation of food in debilitated animals.

ON "PARAPLEGIA" COMMONLY KNOWN AS "WINDSTROKE" OR "KUMREE" AND ALLIED DISORDERS.—(8TH PAPER.)

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THE subject of Paralysis in horses in India has always engaged the attention of Veterinary Surgeons and horse owners in this country, and there still exist very wide differences of opinion as to the true nature of the disease, also as to the cause and treatment. In order to give my experience I have made the following notes, which I have illustrated by some cases which have come under my notice. I have been unable to fix on any one disease which would indicate the pathological condition in all cases. I shall therefore consider the subject of Paralysis in the Horse under the following heads, which I take from the Veterinary Nomenclature.

MENINGITIS, SPINAL.—*Inflammation of the Membranes of the Spinal Cord.*—This may be occasioned by an injury or may be idiopathic. When due to any injury, the site is generally the region of the Lumbar Vertebræ (the loins) and the *symptoms* will be primarily those of loss of power in the hind extremities, shewn by a rolling action, difficulty in backing, turning, or going down hill, the horse will stand persistently and show disinclination to lie down; should he lie down, he will have great difficulty in rising even when assisted, and if the case be severe, he may be totally unable to rise. As the case progresses paralysis becomes more marked and there is also a loss of sensation in the paralysed parts. Inflammation of meninges of the spinal cord is always associated with effusion which causes paralysis by compression. The inflammatory action has a great tendency to extend and it will be found in many instances, that the paralysis which commenced with the hind limbs advances forward till the animal is totally paralysed and dies from Cerebro-Spinal Meningitis, either in a state of coma or phrenzy, the inflammation and effusion, having originated in the loins, advanced till the brain was reached. The following cases will illustrate both the traumatic and idiopathic forms of Spinal Meningitis, terminating in Cerebro-Spinal Meningitis:—

1. This case occurred in a horse which had been "laid up" and blistered; on the third day he was let loose in the day time, and on the fifth day released all together and placed in a loose box, on that night he is said to have fallen but got up again and subsequently again laid down, on the sixth night he again fell and was totally unable to rise, having no power of his hind quarters. He was very excited and plunged violently—I gave him a powerful sedative and he lay tolerably quiet till the evening when he became quite frantic and died apparently from exhaustion. *Post-mortem examination* showed intense inflammation of the Mem-

branes of the Brain and Spinal Cord and a great amount of serous effusion into the spinal canal.

2. This horse was cast at his picket four days previous to any symptoms fo Paralysis being observed but on the fourth day he was found down and unable to rise, the disease rapidly developed and complete paralysis of the hind limbs took place and the horse died in a state of Phrenzy. *Post-mortem examination* shewed Inflammation of the Membranes of the Spinal Cord and Brain, also effusion into the spinal canal and cranium. At the Lumbar portion of the cord there was a coagulum of blood which doubtless originated from vessels ruptured at the time of the horse being cast, the inflammation extending from that point forwards to the brain.

Treatment.—We may perhaps be able to trace the attack to some cause, which is most frequently, I think, the somewhat common accident of the horse reining back and falling over backwards, and from this accident it would be the loins which would be more liable to injury ; the attendant paralysis may be due to simple concussion of the spine, the effects of which might pass off without subsequent inflammatory action or effusion into the spinal canal. Acting on the hope that the case may be of one simple concussion, I would endeavour to check the inflammatory action and I think this is best done by primarily freeing the bowels, and the frequent application of the cold douches to the spine and head. I would, also, endeavour to ensure perfect quietude, by the administration of sedatives, and I would further apply a sedative of Canabis Indicus over the loins. I consider that at this early stage any stimulant or blister is certainly contraindicated, and I would let the horse lie well bedded down, even at the risk of the bed sores. If the case proves to be one of simple concussion, it will often be found that the patient will unexpectedly rise; should, however, no attempt be made to do so, we may be satisfied that the injury is of a more serious nature, and if the paralysis continues, we may be sure that we have Spinal Meningitis to deal with. It is impossible to avoid bed sores when a horse lays for any length of time, and in these cases it is well to avoid turning as far as possible, but after about the second day I would place the horse in slings and continue the same sedative plan of treatment. I will now consider a case of spinal meningitis due to an injury in which there is doubtless effusion but where the case progresses favourably and does not run on to cerebro-spinal meningitis. The paralysis will in this be confined to the posterior extremities and will gradually improve as the inflammation subsides and the effusion becomes absorbed. When the horse is so far progressed that he may be taken from the slings, he should be placed in a roomy loose box and given a short walk morning and evening. It is at this time ing absorption, and the application of the old fashioned charge or what the native salootries term a "*lape*" I have found to have an excellent effect.

APOPLEXY, SPINAL.—This would signify a sudden influence affecting the spinal cord, producing loss of power and sensation, usually primarily affecting the hind limbs, but it may be general, affecting all the extremities and subsequently the brain. Spinal Apoplexy may be Traumatic, due to effusion of blood or hæmorrhage into the spinal canal from a ruptured blood-vessel which has given way either from accidental cause or from chronic disease of its coats. Idiopathic cases are due to acute disease of the spinal cord itself; the attacks may be quite sudden or more gradual, the result being the same, complete or partial paralysis. Death will sometimes occur within a short time of the attack or the case may be prolonged and recovery, either partial or complete, takes place. *The general treatment* I would recommend is similar to that which I have mentioned under spinal meningitis, but I would not delay putting the patient in slings. In these cases there are always more or less marked symptoms of nervous excitement, therefore the sedative plan of treatment appears especially to be indicated.

PARAPLEGIA.—*Paralysis of the posterior portion of the body.* This is a symptom of disease rather than a disease itself. It may result from any of the causes I have mentioned above. In India, it is supposed to be produced especially by the ill effects of the wind and is more prevalent in certain districts, notably Burma and the Western Coast of India, the disease is also known by the name of "*Gone in the Loins,*" "*Kumree,*" and "*Windstroke.*" I am not at all content with the word "Windstroke," for it refers only to a single factor in the probable cause, and it ignores that there is apparently a condition of the atmosphere necessary beyond the mere wind which plays its part in the production of the disease. The climate of Burma and of the Western Coast of India, is very damp from the excessive rainfall and this humidity of the atmosphere doubtless exerts its influence. I have, however, known cases occur in the hottest and driest stations. The Mysore plateau is noted for the prevalence of the South West and North East winds and yet the station of Bangalore and the Remount Depôt at Oossoor are both remarkably free from cases of what is termed "*Windstroke*" amongst horses; from this I consider that there is something more in the climatic cause than the wind itself, and in the depressing influence of the moist heat of Western Coast of India and of Burma, which lowers the vital powers, we have a probable cause, and it is to be observed that the climate of both these localities is noted for the relaxing and enervating effect on Europeans stationed there. Great stress is laid on the effect of a chill, but in such a treacherous climate as that of Bangalore and Oossoor the liability of the horses to a chill would appear to be far greater, yet the number of cases of so called "Windstroke" is notoriously small; we must therefore look further than the "Wind" for an absolute cause of the disease. I would prefer to drop the term "Windstroke" altogether, as often misleading, and I would bring this disease under the head of Spinal Apoplexy. Mr. Poyser is of opinion that many of the cases of the so-called "Windstroke" are in reality "Rheumatoid Arthritis," and that what has been mistaken for Paralysis is "but a palpable expression of the sufferer's inability to bear his own weight." In the cases which have come under my notice, I fail to find any symptoms of Acute Rheumatism, for in Paraplegia there is not only a loss of power but at the same time a *loss of sensation,* whereas we know that in Rheumatism, sensation is most acute.

I am able to relate several cases of Traumatic and Idiopathic Paraplegia. I will first quote, from my Note Book, a few cases which were traceable to direct cause:—

1. A horse was cast in his stall and slightly bruised, four days subsequently symptoms of paralysis were shewn and the horse was found down and unable to rise. He had total loss of power and sensation in the hind limbs, he died the same evening in an unconscious state. *Post-mortem examination* shewed serous effusion throughout the whole of the spinal canal and a sero-sanguineous effusion in the Lumbar region.

2. A case of Paraplegia which proved fatal after prolonged treatment. *Post mortem examination* shewed the cause to be an exostosis protruding into the spinal canal from the Third Lumbar Vertebra, causing pressure on the cord, which was attenuated at this part; there was but little effusion, and the paralysis was confined to the hind extremities.

3. A case which I consider to have been one of reflex paralysis, due to disease of the kidneys, as was proved on post-mortem examination. The patient died on the third day after the paralytic symptoms set in.

The above are, I think, sufficient to illustrate Traumatic Paraplegia. I will now quote a few cases of Idiopathic Paraplegia which would probably be termed "*Windstroke,*" "*Gone in Loins,*" or "*Kumree*":—

1. A case of Paralysis commencing with the hind extremities and gradually advancing, causing death from Cerebro-Spinal Meningitis. There was great serous effusion into the spinal canal but no sanguineous extravasation or any injury detectable.

2. A case of sudden Idiopathic Paraplegia occurring in a very old horse. I consider this to be a case of Spinal Apoplexy due to old age and break up of the constitution.

3. A case of partial Paraplegia attended with great nervous excitement and involuntary muscular movements. The patient made a slow but perfect recovery.

4. A fatal case of Paraplegia in a horse very debilitated from the effects of the voyage from Australia.

I think I have now given sufficient cases to show that the causes of Paraplegia are numerous. We are in some cases able to trace a direct cause, but in others fail to do so, and it is often the case that these are indiscriminately recorded as "Windstroke." As I said before, I would prefer to term these cases "Spinal Apoplexy," for I am confident that the true seat of the disease is the spinal cord.

In nearly all the cases that I have had to deal with if the patient has been observed before he has absolutely fallen there has been found a peculiar excited condition of the animal, a nervous twitching of the muscles of the flank, shoulders, lips, &c., and from my experience I have found that these symptoms may be taken as premonitory of paralysis in some form; it may be Paraplegia, Hemiplegia or other local Paralysis. These symptoms indicate a disturbance of the nervous system generally, which culminates in Paralysis. In many instances, however, the first that are reported are difficulty in getting up or down, or a rolling action in walking. There may also be attendant fever and refusal of feed.

The routine *treatment* I adopt is, primarily, the administration of a brisk purgative, subsequently I give, morning and evening, a sedative of Ext. Belladonnæ and apply a sedative of Ext. Cannabis Ind. over the loins. If what I have described as the premonitory symptoms pass off, I do not place the animal in slings, but if the disease progresses and the symptoms of paralysis become more marked I do so. Even in the most favourable cases, recovery will be very gradual and I have found the long continued use of Strychnine in *small* doses to have a most excellent effect. In some cases the slow recovery is due to unabsorbed effusion into the spinal canal causing pressure on to the cord, Iodide of Potassium will be found to be of assistance in these cases. Quiet, warmth, and gentle exercise are necessary to aid the reparative process, and I would recommend the application of a charge or *lape*. The action of these is difficult to explain but their beneficial effect is undoubted and I think it is due to the tonic action of the ingredients on the local nerve fibres, as well as to the mechanical effect of securing rest to the debilitated structures.

HEMIPLEGIA.—*Paralysis of the Lateral Half of the Body.*—The precise seat of the cause is difficult to determine, but that it is in the brain, is, I think, shewn by the general symptoms usually present. It may arise from injury to that particular side of the brain, or pressure caused by the presence of a tumour, or effusion of blood or serum. From my Note Book I am able to quote several cases of well marked Hemiplegia which have occurred in my practice:—

1. In this case there was a loss of power on the right side. When placed in a loose box the horse could not turn to the right

side and he persistently stood leaning against the wall, he fed, and did not evince any pain. The condition of the urine was remarkable, it containing pus and lymph casts. I treated the case with general tonics, keeping the animal well clothed, when he was first exercised he walked all on one side, but gradually improved and perfectly recovered.

2. This was an idiopathic case; it commenced with lameness on the off fore leg and subsequently the whole of the right side was partially paralysed, the tail, the head, and upper lip were drawn to one side and the muscles wasted. The case did well, the horse recovering after having been under treatment for ten months.

3. In this instance the symptoms of paralysis were also shewn primarily in the off fore leg, the limb was moved spasmodically, advanced but little, and seemed to take no share in the progressive movements. The head and upper lip were drawn to one side and the horse was in that peculiarly nervous condition described above. The paralytic symptoms rapidly progressed and the horse was destroyed.

4. This was a remarkably severe case. As Hemiplegia is said to be rare in the horse, I will quote it fully for it is very typical.

A Waler mare, which had been working in a cart, was found to be very lame in the near fore. I found her to have a peculiar spasmodic action noted in the previous case, subsequently there set in a state of remarkable nervous excitement. The mare, which had hitherto been very quiet, had violent fits of nervous excitement, although she could move only with difficulty she was never quiet and kicked violently in her stall. I gave her a sharp purgative, and subsequently a tonic of Iodide of Iron, and a sedative of Ext. Belladonæ in the evening. I afterwards gave Iodide of Potassium, with no benefit. I now applied a native charge or "Lape," along the spine and over the near shoulder. This remained on for about three weeks, during which time the mare had perfect rest. There was no decided improvement in the action, but, as the nervous excitement was less and the mare had improved in condition, I now gave walking exercise and applied, with friction, mercurial ointment with the spine and over the near shoulder. From this time there was gradual improvement and I was able to increase the exercise with benefit. The mare was discharged after having been five months under treatment. No special treatment can be laid down for all cases but the general treatment must be, whilst subduing any nervous excitement present, to give systemic and nerve tonics, and to ensure rest.

ON "LYMPHANGITIS," "INFLAMMATORY ŒDEMA" OR WEED.—(9TH PAPER.)

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THE disease is in England known provincially as "Weed," "Monday morning disease," "a shot of grease" and I dare say by many other names with which I am not acquainted. It is also called Inflammatory Œdema.

Lymphangitis usually occurs in one limb and is most frequently seen in one of the hind limbs. It is a constitutional affection and is known to be hereditary in some instances. The attack is attributed to irritation of the Lymphatic vessels, due to these vessels being called upon to take up lymph in excessive quantities and of unusual "richness." The heavier, low-bred, hairy-heeled horses which are well fed and are used for heavy slow work are more prone to the disease.

It is certain that horses that are well fed and regularly worked on being suddenly thrown out of work become pre-disposed to the disease, in many instances the simple rest on Sunday being sufficient to induce an attack, hence the term "Monday morning disease." This fact with regard to the disease is well explained thus, the normal exhaustion of the tissue by the usual work being stopped, probably without any reduction in the amount of food given, there is suddenly a large amount of superfluous nutritive material taken into the system which must be absorbed by the lymphatic vessels, which are thus engorged and irritated and inflammation is induced. That this effect does not result in all horses in similar circumstances can only be explained by the constitutional nature of the disease and it necessarily occurring in animals which have a pre-disposition thereto.

Lymphangitis sometimes occurs in better bred horses, in illustration of which I have a case at present under my care of a mare which is liable to recurrent attacks, she is a fairly bred well shaped animal, owing to an accident she was unfit for issue to the service and has been employed on the Depôt Farm, where she has done good service at slow work, she keeps her condition but is not gross, she however is also subject to attacks of simple Colic, and I have found that if, on that account I lay her up, almost invariably an attack of Lymphangitis supervenes. I am of opinion that not only does the phlegmatic disposition and breed and unnecessarily high feeding pre-dispose to the disease, but I also consider that the nature of the work, that is, slow, heavy drudgery creates a pre-disposition, and the fact that it is the hind limbs that are more frequently affected is probably due to the heavy, straining work which is often very severe on the hind limbs.

Symptoms:—A rapid and painful swelling of one of the limbs, usually one of the hind, general depression, and high fever, the bowels are usually constipated and the urine scanty, the pulse is rapid and the visible mucous membranes injected. The anxious expression of the patient testifies to the acute pain he suffers. The swelling increases rapidly, sometimes till it would appear as though the skin would really be burst, and there is a serous exudation bedewing the surface of the skin; when the effusion ceases there will be a subsidence of the acute symptoms, the pulse will be more natural, temperature lower and the patient generally brighter.

Treatment :—At the onset without waiting for any preparation give a purgative (aloes, when it is necessary to administer it without the usual preparation, is best given in solution). At first apply long continued hot fomentation, this rather encourages the effusion which seems to be a natural relief to the affected parts. When the effusion is at its height, apply, all round the œdematous limb, as many leeches as can be got to hold and subsequently foment to encourage the bleeding from the leech bites. The acute symptoms will have passed off, and the object of the treatment now to be adopted must be, to restore the health of the animal and to bring back the œdematous limb to its natural condition. Give slow walking exercise at the horse's own pace as early as possible, give iron tonics and feed liberally but not with food rich in nitrogenized constituents. An occasional diuretic will assist in the absorption of the effused fluid. Apply a broad warm bandage to the affected limb firmly and evenly, give long hand rubbing.

Do not keep the horses laid up longer than is necessary, but put him to work as soon as possible and it will be found that usually the fulness will gradually disappear. In obstinate cases I have not found the application of a blister of any service and this failure I attribute to the enforced quietude, whereas I find that exercise is most beneficial. I would recommend that diluted mercurial ointment be applied with long continued friction, this need not interfere in any way with the work or exercise of the horse.

The above is the routine treatment I have found most successful, but in some cases in spite of all treatment, after repeated attacks of "Lymphangitis" a chronic "thick leg" will result.

I look upon the disease of Lymphangitis as one that runs a special course and I do not think we can by treatment beneficially cut it short and our endeavour must be, whilst relieving any acute symptoms, to endeavour to assist nature.

I was taught that general bleeding, almost to exhaustion was necessary in the early stages of this disease and in the first days of my professional career this was my practice, however my experience has shown me that this is not only unnecessary but that such depletion retards the curative process, and I have found that the application of leeches after the acute symptoms have subsided has a very beneficial effect in hastening a successful termination of the case,

ON "SPAVIN."—(10TH PAPER.)

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A very good definition of Spavin is given in Professor Williams' work on Veterinary Surgery. "An Exostosis on the inner and lower part of the hock arising from inflammation of the cuneiform and metatarsal bones, terminating generally in anchylosis of one or more of the gliding joints of the hock." There are, however, variations in the position of the Exostosis and other complications which will be considered as we go on. The DIAGNOSIS of Tarsal Exostosis is sometimes very difficult and it often occurs that two men of equal experience are quite opposed in their opinion, as to the existence or not of Spavin. The evidence to assist us in forming a correct opinion is often most contradictory, and when we go into the subject of the action of the hock considered relative to any peculiar formation, we shall find it indeed most puzzling. There can be no fixed rules laid down and it is only by constant practice and long experience that a true appreciation of the indications of Spavin can be acquired.

The PATHOLOGY of Spavin is briefly this. Inflammation in the ligamentous structures of the hock, or in the synovial capsule, or in the small bones of that joint, resulting in their ossific union and a subsequent deposition of bone on the inner surface of the hock.

The CAUSES of Spavin are:—

1. *Hereditary Predisposition.* This is acknowledged with regard to Spavin, as it is in other ossific deposits, ringbone, sidebones, and splint, there being in some animals what is technically known as an ossific diathesis.
2. *Sprains to the ligamentous structure of the hock.* This is an especial cause in young horses, that are put to work before the structure of their limbs is duly matured. The hock, which from its position and function is called upon to bear great strain, is at this time especially liable to give way. In North Country Horses, Persians, and Arabs a predisposition to Spavin is, in my opinion, caused by the custom of picketting the horse by the head and heel, thereby keeping the hind limbs in an unnatural position and throwing a constant strain on the hock. Young horses going through their first training in the Riding School, often become the subject of Spavin, due to sprains to the hock in turning, reining back, passaging, &c. After they are drafted to their work their hocks are often severely tried in pulling up from a gallop, this is especially the case in horses used by markers and as Royal Artillery Wheel Horses. I have, from all the Annual Veterinary Statistical Reports that I could find, made some statistics with regard to the occurrence of Spavin amongst the horses in the different branches of the service and I find that cases are recorded in the following proportion:—

1. Madras Light Cavalry	1·08
2. Regiments of British Cavalry ...	·9
3. Batteries of Royal Horse Artillery	·48
4. Batteries of Royal Artillery ...	·36

The Madras Native Cavalry are horsed almost entirely with Persians and North Country Horses. The British Cavalry till recent years had a large proportion of these horses, but are now horsed almost entirely by Walers. From these statistics it would seem that although much may be attributed to the caste of the horse, there is more than that required to explain the numbers of cases of Spavin in Regiments of British Cavalry being nearly double those in the Batteries of Royal Horse Artillery. I think the explanation is to be found in the fact that at the time of checking the pace or halting it is, in the Royal Horse Artillery, only the wheel horse that receive any severe strain on their hocks, and that the halt is necessarily more gradual, whereas in the Cavalry every horse has a like strain on its hocks. The comparatively small number of cases of Spavin in Field Batteries of the Royal Artillery is easily to be accounted for, by the pace being steadier and consequently the strain being less. No horse should be put into a wheel of gun till he is full six years old, after this age, if his hocks are then sound, strong, and of good formation, and the horse is otherwise adapted for the severe work of the wheel, he will work for years.

3. *Concussion,* must also be looked upon as a cause of Spavin, and this is I think more common amongst lighter horses used for fast road work; Spavin arising from this cause is I think more gradual in its formation and does not at first cause such acute lameness as that arising from Sprain. Horses with ill-shaped hind limbs, in which the constant concussion or jar caused by the feet striking the ground, is not evenly distributed, as it should be, are more liable to Spavin from this cause, for concussion acts as a direct producer of Ostitis, which assumes a chronic form, in the bones of the hock, they being prone to inflammatory action.

The CONSIDERATION OF THE GENERAL CONFORMATION OF THE HOCK is intimately associated with the subject of Spavin, for the joint varies very much in different animals. Many of the formations have received distinctive names. It will be necessary to enumerate the chief of them :—

1. *The "Sickle-shaped" hock,* is one curved at more than the natural angle. This is generally acknowledged to be a very defective hock, but is said not to be so liable to Spavin as to Curb; this is my experience, and I would add that I have found this class of hock especially liable to Bog Spavin.

2. *The "Straight" hock,* which is the opposite to the "Sickle shaped," is one that is not flexed at the natural angle. This is also a very faulty formation of hock and one frequently the subject of Spavin, which may be accounted for by the inevitable concussion not being relieved by the natural resistance of the tendons and ligaments entering into the formation of the hock, and so having a more direct effect on the bones, producing Ostitis and subsequent Spavin. Horses with this formation of hock are in my opinion very liable to Sprains of the ligaments of the fetlock joint, more absolute weight being thrown on them than is natural.
3. *The "Cow" hock.* A true "Cow" hock is that which turns inwards till the points of the hock almost touch, and from the hock to the foot the limbs turn outward, the feet being placed quite wide apart. This is a very defective formation of hock, a great source of weakness, and creates a decided predisposition to spavin. "Cow" hocks are often associated with other defective formation in the hind limb, the cow hocked horse being often at the same time "Cat"-hammed and "Goose"-rumped. This defective formation is, I think, often the result of injudicious breeding, possibly the dam or sire being either too young or old to produce a strong healthy foal and it is a well known result of compelling unfortunate animals to carry weight before their limbs are properly matured. Hocks are often placed unnaturally close, but when the legs below the hock are straight it is not so objectionable as the true "Cow" hock.
4. *The formation which is the opposite to the Cow hock, that in which the hocks are placed unnaturally wide apart.* This formation is objectionable, but if the limbs be low and the hocks be straight it is not a special predisposition to disease; the horses are usually stiff movers and uncomfortable to ride. Should, however, the legs twist in, as they sometimes do, this is a most objectionable formation and one very prone to disease.

The above four descriptions illustrate the *position* of the hock rather than its *formation.* We have a great variety of FORMS OF HOCK many of which have received distinctive names :—

1. *The "course, strong" hock* :—This signifies that the natural bony processes are largely developed, which gives the hock a coarse or rough appearance. It is often very difficult accurately to distinguish between these natural formations and exostosis the result of disease. This will be fully considered hereafter when the symptoms of spavin are spoken of.
2. *The "narrow, weak" hock* :—Narrow from behind forwards or, it may be said, as seen sideways. This is especially a

weak hock and one which I consider particularly liable to disease, especially "spavin."

3. *The "broad" hock*:—The opposite to the last named, being broad from a side view. This is in my experience a very strong hock and rarely the subject of disease.
4. *The "tied in" hock* :—This is one which is small at the base from deficient development of the heads of the metatarsal bones. This is I consider a weak hock.
5. *The "thin flat" hock* :—This is narrow when viewed from the front or from behind. This is due to a general want of development and is a weak hock and one prone to disease.

On the internal aspect of the hock we have a variety of formations and in the consideration of the subject of spavin, it is most necessary correctly to estimate how far these conformations may exist compatible with soundness.

The STUDY OF THE FORMATION OF THE INTERNAL SURFACE OF THE HOCK will be greatly assisted by plates shewing the sound hock and unusual development which may exist in a sound hock.

PLATE I. Represents *the front view of a perfectly sound hock*, without any unusual development. This is a large hock and the processes of the bones are well formed but not unusually developed.

PLATE II. Shows *a sound hock with an unusually developed point of the astragalus.* The hocks having this formation are commonly known as *"Full" Hocks.*

PLATE III. Shows *a sound hock with a large development of the process on the internal aspect of the cuneiform medium and of the head of the large metatarsal bone.* This is a very common formation and the greatest care is required in diagnosis, for this fullness occurs in the most frequent seat of spavin. Our great guide must be the careful comparison of the two hocks, and noting the slightest difference in conformation, then observing carefully the action of the horse, if the action is good and the hocks are pairs, the case may generally be put down as one of coarse hocks. Young Walers have often naturally very coarse hocks.

PLATE IV. This plate shews *a sound hock with both the above mentioned developments, viz.,* the point of the astragalus and the cuneiform medium and head of the large metatarsal, this gives it a round appearance and the hock gets the name of the *"Round Hock."*

PLATE V. Represents the *"Flat hock"* This is *a form of hock in which all the processes of the bones at the internal surface of the hock are small, which gives it the appearance of a long, flat hock.*

In my opinion this is a weak hock and one prone to disease.

PLATE VI. This plate shows *the internal surface of the hock viewed from behind.* It is necessary to be acquainted with this for the position of the Exostosis forming Spavin varies, and it is often seen involving the small cuneiform and internal small

metatarsal bone. A Spavin so situated is said to be "far back" and is thought by some not to be so detrimental as one in other positions.

PLATE VII. Shows *a sound hock with the small cuneiform bones and head of the internal small metatarsal bone unusually developed, giving the hock the appearance of having Spavin situated "far back."* Our guides, here also, to accurate diagnosis as to the presence of disease or not, must be careful comparison to see if both hocks have the same conformation and then observation as to whether the action is interfered with. I think the above plates are sufficient to shew that, from the outward appearance, there are many formations which in some cases are quite compatible with health and in others are true spavin. I have a specimen now before me of a hock of the character shewn in Plate V, and described as a "Long Flat" hock in which there is no exostosis which could be detected either by the eye or touch, yet the cuneiform bones are united by ossific material and the horse was in reality spavined; in this case there would be nothing to guide, in detecting the spavin but the action. The Veterinary Surgeon who gave me the specimen, told me that the horse had been lame for a long time, evidently from hock lameness the cause of which he considered to be "*Occult*" spavin, which diagnosis was proved post mortem examination to be correct.*

In cases where there is acute and persistent hock lameness and no perceptible spavin, I think we may be guided in our opinion as to the true nature of the disease by the age of the horse. In the young animal the lameness will be more often due to incipient spavin and in the aged horse to ulcerative disease of the bones of the hock. In the latter the lameness will be very severe and will increase as the disease progresses but in the former as the ossification develops and anchylosis of the gliding joints of the hock becomes complete the lameness decreases and the horse although permanently unsound may do good service for years.

I now pass on to the subject of HOCK ACTION, CONSIDERED WITH REGARD TO HOCK FORMATION. Absolute hock lameness, may for the time be passed over, as indicative of existing disease which at once decides the question of unsoundness. There are many horses which have defective action without any other symptom of disease; this is an important point to be considered. It has been said that to examine a horse fairly and in an unbiassed manner, he should be trotted first and examined afterwards. I think, however, that the examination naturally should come first as the observation by either the sight or touch is after all only one portion of the examination, the trotting in hand being equally important, confirming or otherwise the opinion as to soundness.

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* Hock lameness due to "*Occult*" Spavin may also be due to ulcerative disease of the bones of the hock or to the inflammatory action in the bones before any ossific deposition takes place.

I have heard it said by a very experienced man after examining what may be termed a very doubtful pair of hocks and then trotting the horse, "Well! if that horse is spavined *he* does not know it." Many young Walers have naturally coarse angular hocks which may be condemned by some, I have dissected many of these hocks and have rarely found disease. Hock action when considered relative to hock formation is often most contradictory and puzzling. I have often met with cases in which the horse had large coarse hocks, which on first examination would probably be condemned as being spavined—yet on trotting the horse he is found to have really good hock action, quite incompatible with existing disease. On the other hand a horse with a perfectly clean hock will often be found to have no hock action at all and to drag his toes along. The natural action of the hind limbs in horses varies very much in different animals, defective action may also vary, from absolute lameness to mere stiffness which may result from peculiar conformation and be independent of disease. The natural healthy action of the hock is ample, smooth flexure of the joint, the lower part of the limb is well advanced and the foot placed flat on the ground, any deviation from this has to be accounted for. Faulty action of the hind limbs may, of course be due to malformation or disease of parts above or below the hock; this must be put on one side. I have recently had to examine a large number of horses and *I have made a few notes with regard to the shape of the hocks and I subsequently noted any peculiarities in the action,* with the following results.

1. Hock full, pairs—flexes hocks, fair action.
2. ,, ,, ,, ,, ,, short, catching action.
3. Spavin near hock—short, stiff action.
4. Spavin both hind—exostosis far back; very stiff, bad action; drags toes of both hinds.
5. Full hocks, pairs—fair action.
6. Spavin near hock—short, catching action.
7. Spavin both hind—exostosis far back, but stiff action; drags hinds.
8. Spavin both hind; exostosis far back; no hock action; drags hinds.
9. Spavin off hind—fair action.
10. A flat, small hock, no perceptible spavin,—no hock action; very stiff; drags both hinds, badly.
11. Spavin near hind—fair action.
12. Full round hocks—poor action.
13. Very full, coarse hocks; pairs—action good.
14. Spavin both hocks—bad stiff action; drags toes.
15. Full hocks, pairs; the fulness far back—long strides; poor flexion but no dragging of the toes.

Nos. 1, 2, 5, and 15 I have described as having *Full* hocks (*vide* Plates II and IV) in each case the hocks were pairs. In neither of the three first cases was the flexion of the hock interfered with, and in neither was there any dragging of the toes. In the last case there was a fulness far back (*vide* Plate VI). Nos. 3, 6, 9, and 11 were from the primary examination, apparently spavined in one hock, the exostosis being situated to the front and low down as shown in Plate VIII. Two, Nos. 9 and 11, I have described as having fair action—these may, therefore, have simply coarse hocks (*vide* Plate III). Nos. 3 and 6 had a short, stiff, and catching action but it must be noted that in neither case was there any dragging of the toes. No. 14 was spavined in both hocks the exostosis being in the position described above, (*vide* Plate VIII). Nos. 4, 7, and 8 were spavined in both hocks, the exostosis being situated "far back," that is by the cuneiform parvum (*vide* Plate VII). It will here be remarked that in each case there was bad stiff action and dragging of the toes. No. 10 was a small flat hock (*vide* Plate V) there was no perceptible spavin, but the limbs and toes were dragged badly. Although there was no perceptible spavin I think that the cuneiform bones were united by ossific union. No. 13 had very full coarse hocks; the hocks were pairs and the action good. I think that these hocks were sound and of the formation shewn in Plate VII.

This paper would be perhaps incomplete were I to omit the subject of the treatment of spavin, I will therefore briefly state the objects to be aimed at in treatment and the means to be employed. In case of incipient Spavin in which there is hock lameness and no exostosis has yet formed, the patient must be thrown out of work and rested entirely, put on reduced feed and given a dose of physic if necessary, the hock should be fomented and subsequently blistered. I prefer in all cases of disease of bony tissues the ointment of Biniodide of Mercury as this blister seems to have more than a superficial effect. The blister acts equally by ensuring rest to the diseased structures as by the effect of the counter-irritation. Our hope in the earlier stage is that the ossific union of the gliding joints may be completed and the horse may become serviceably sound. The rest however is most important, for if the inflammation already existing is increased by exercise the disease is aggravated and may possibly terminate in ulceration of the articular surfaces of the bones and cause permanent lameness. Subsequently, after the exostosis has formed, should the lameness continue, I would not recommend longer rest but would put the horse to slow and light work. In the early stage of the disease I would deprecate the use of the actual cautery, as the same result may be brought about by less severe measures, whereas if after firing, the horse does go sound, he is permanently blemished and his value is depreciated.

The treatment of confirmed spavin is a subject on which there are many opinions; the firing iron and pyro puncture having each their advocates, tenotomy and neurotomy have been suggested but have never come into general practice. I think, however, the most practical way of dealing with cases of confirmed spavin is to endeavour to find a place for the horse where his services may be utilized. There are many employments for horses where the pace is a walk and it is into these we should put the confirmed spavined horse. We all know of spavined horses doing excellent service at farm work and continuing to do it, often for years. It is true that their hock action is bad, but often the lameness is slight, and the horses do the work in comfort to themselves and with profit to their owners. In cases of lameness from "Occult" Spavin due to ulceration of the articular surfaces of the bones of the hock, rest is even more important and here, also, we must hope that the gliding joints of the hock may become anchylosed and that all irritation by attrition having ceased the ulcerative disease may be arrested.

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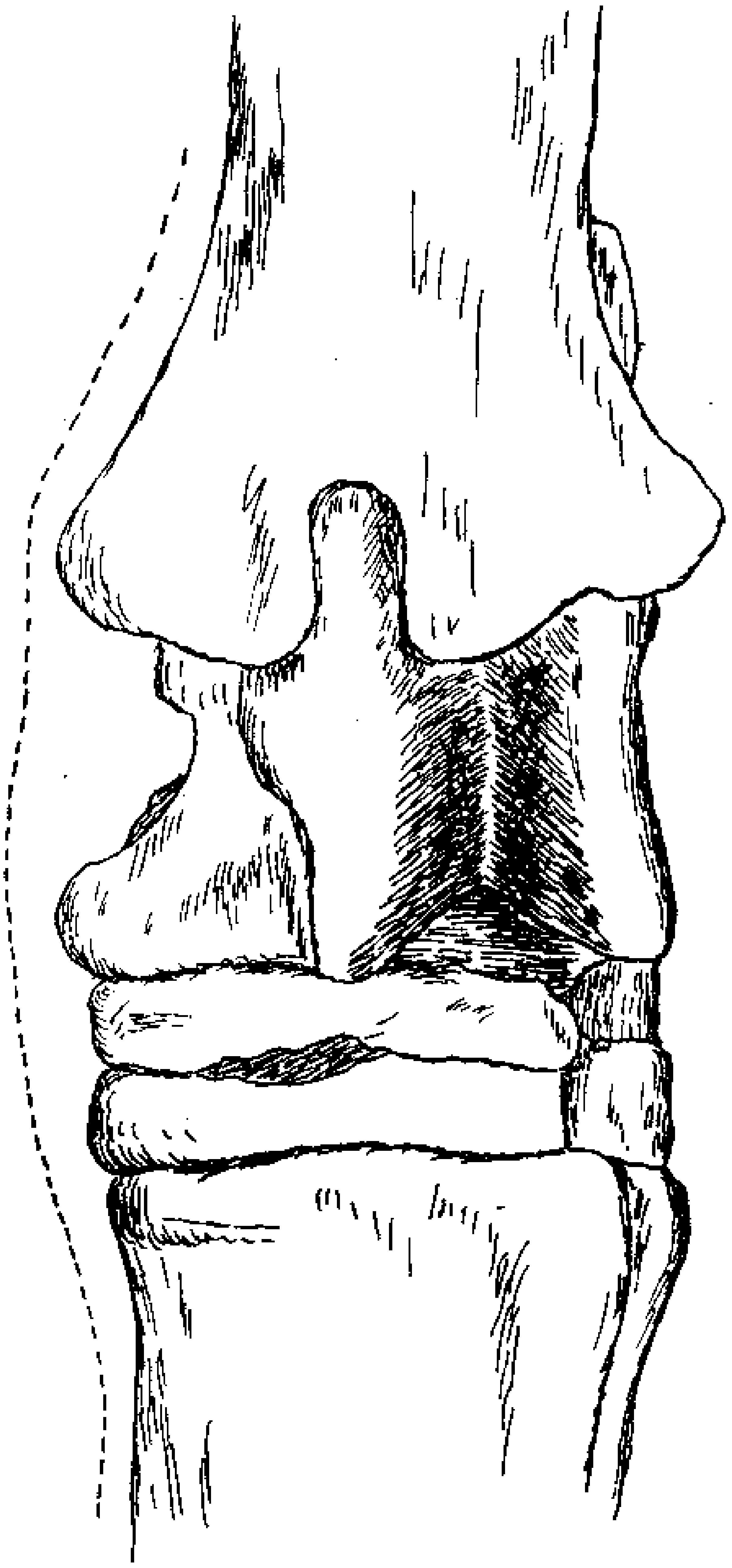
PLATE I.



Shewing a sound Hock with no unusual developement.

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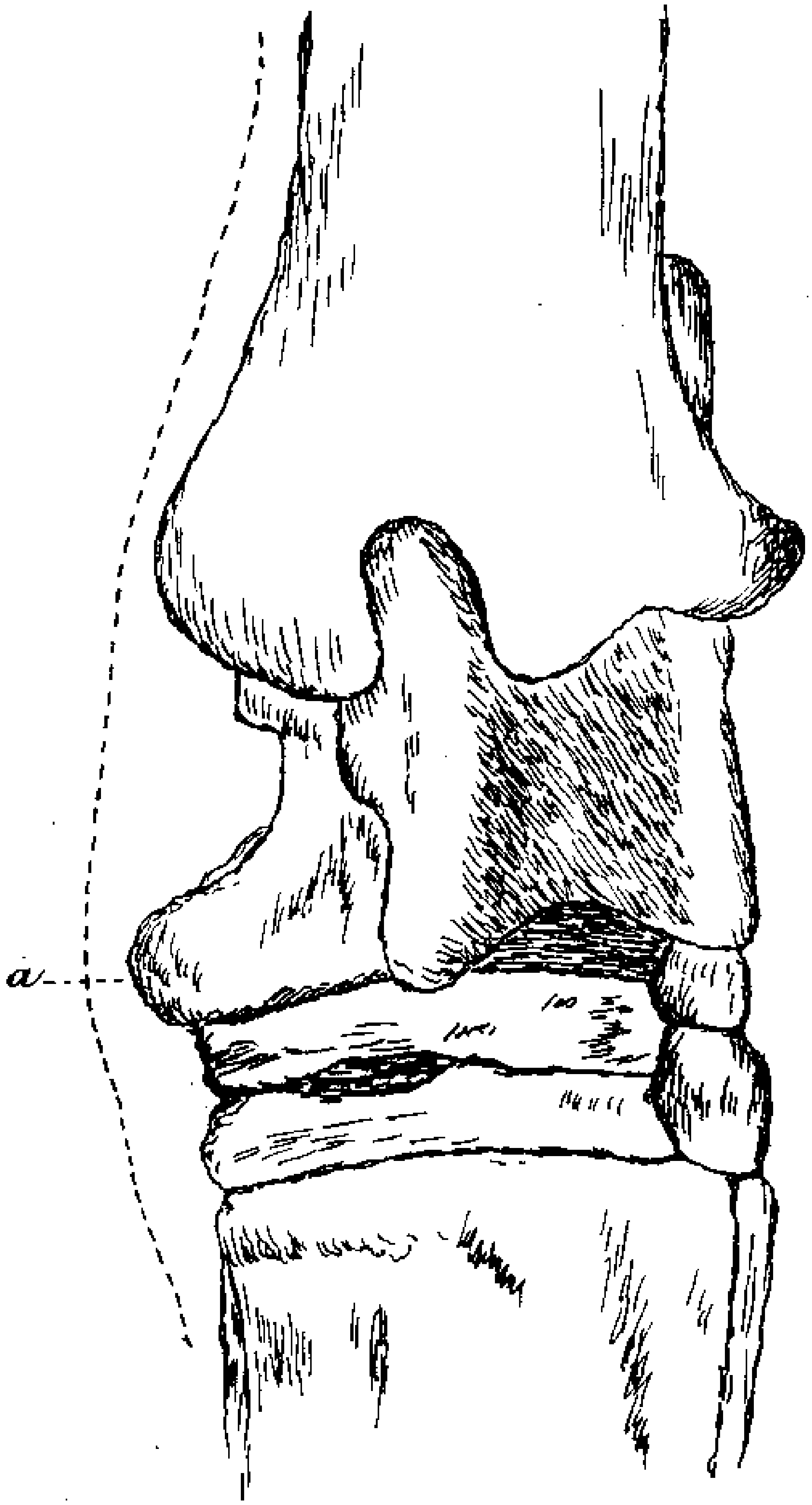
PLATE II.



Shewing a sound Hock with unusual developement of the point of the Astragalus (a.)

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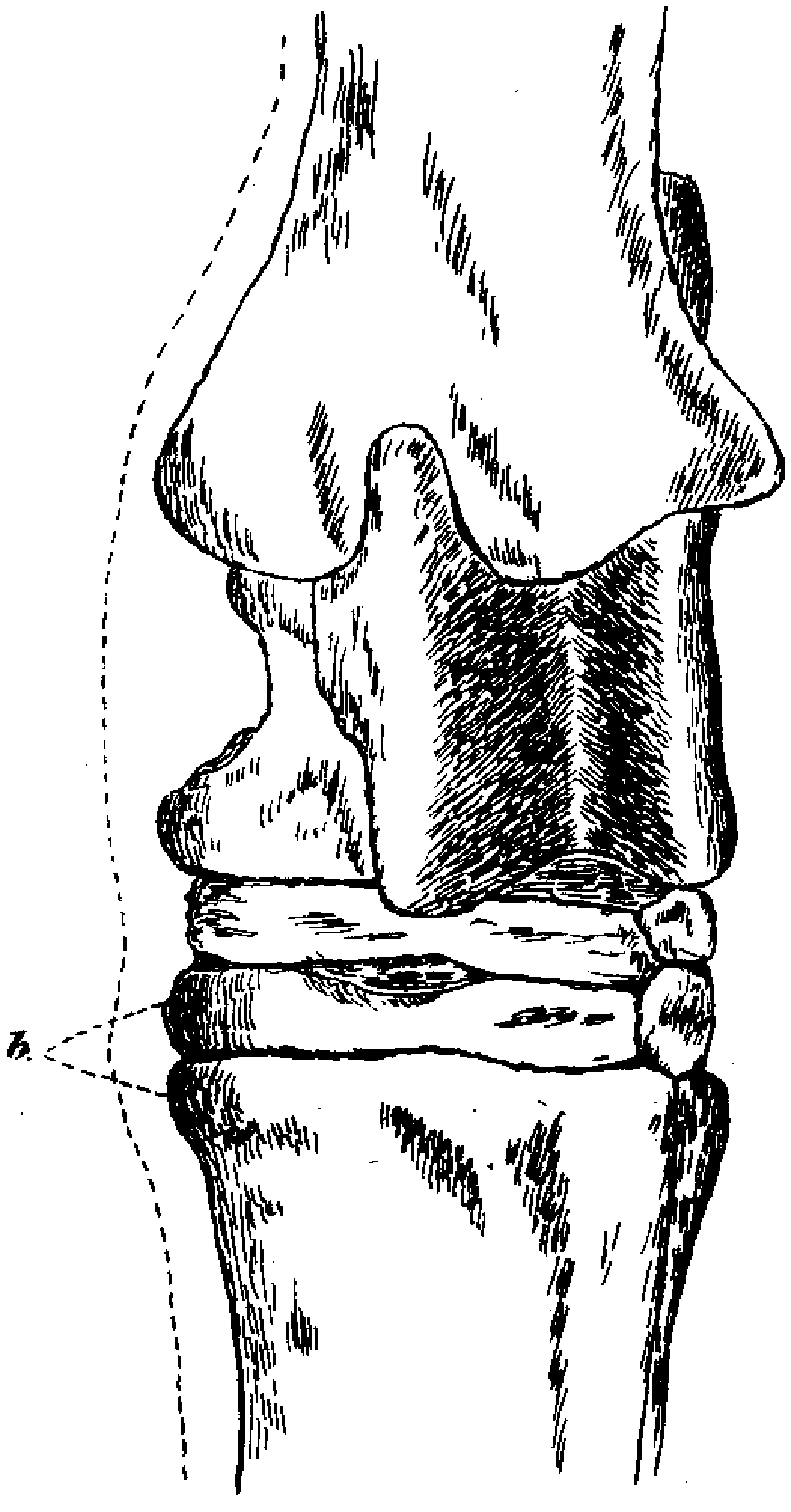
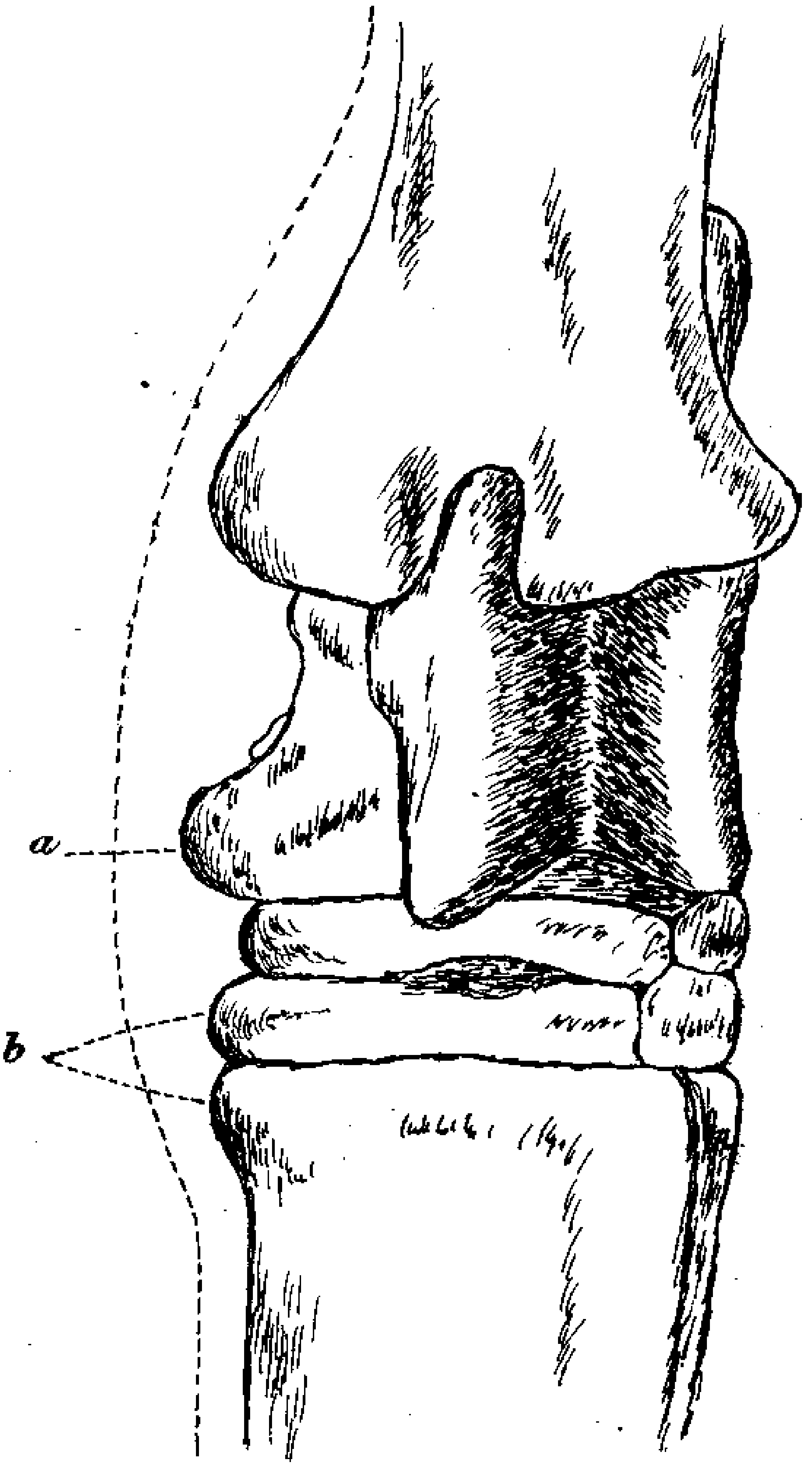
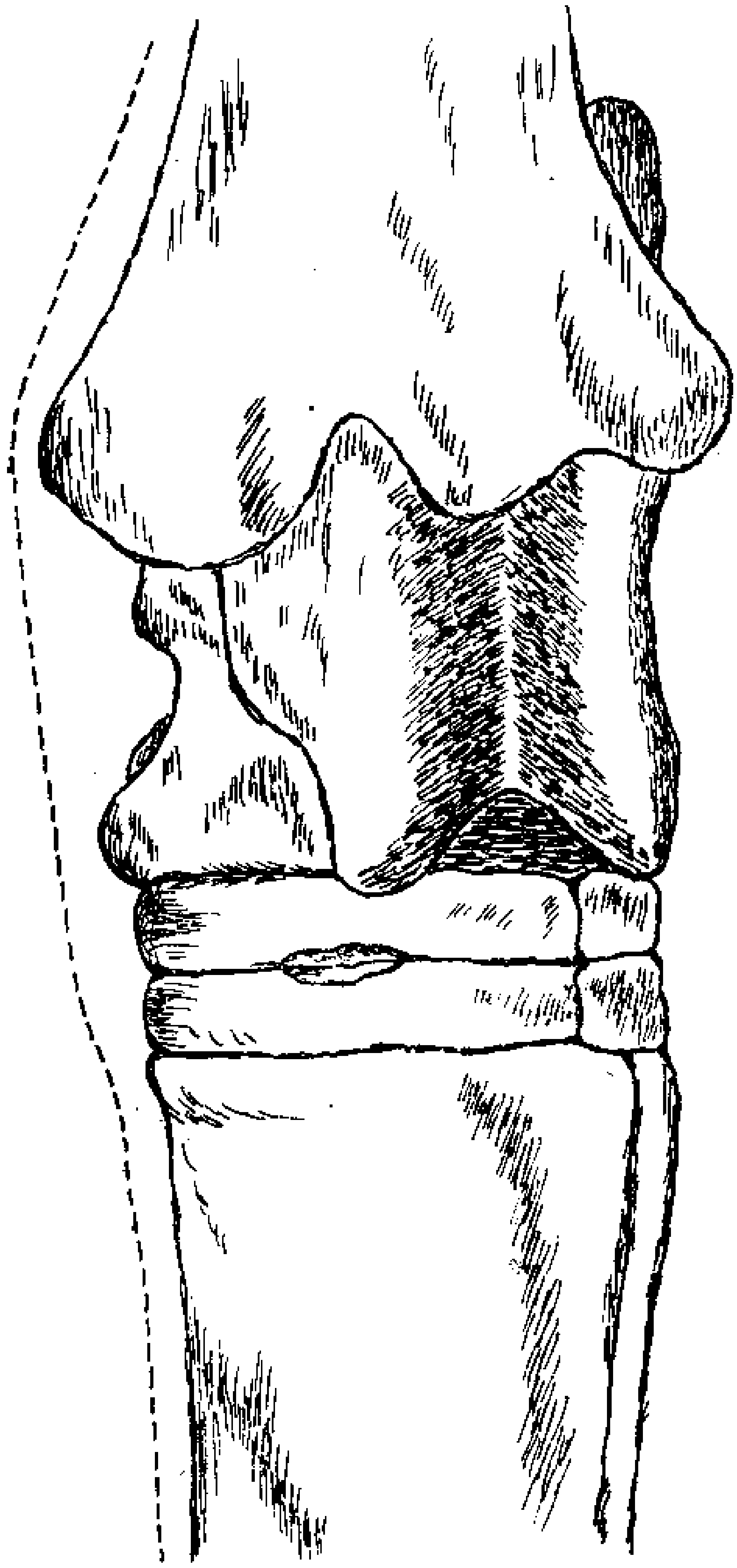


A sound Hock with unusual developement of the process of the Cuneiform Medium and head of the large metatarsal bone (b)



A sound Hock having both the unusual developements shewn in the preceeding Plates (a & b)

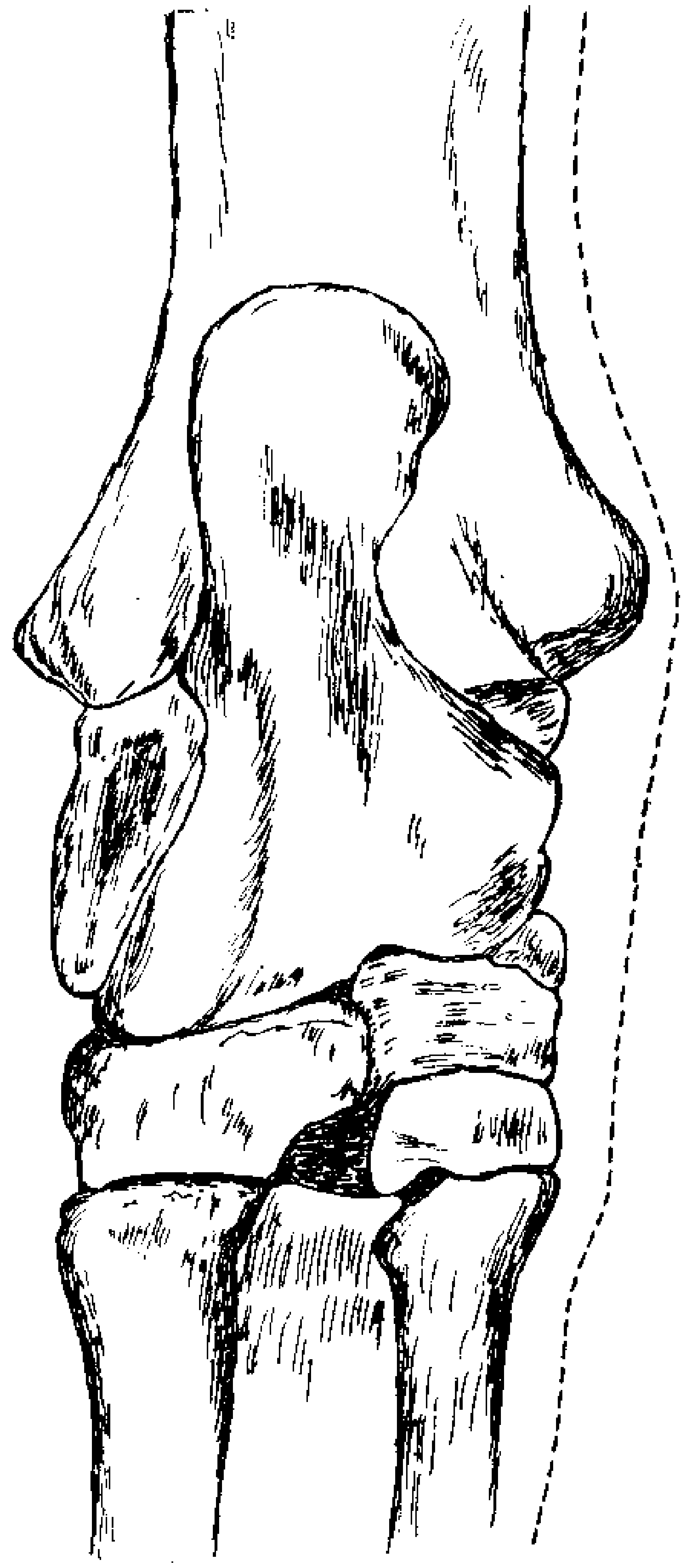
PLATE V.



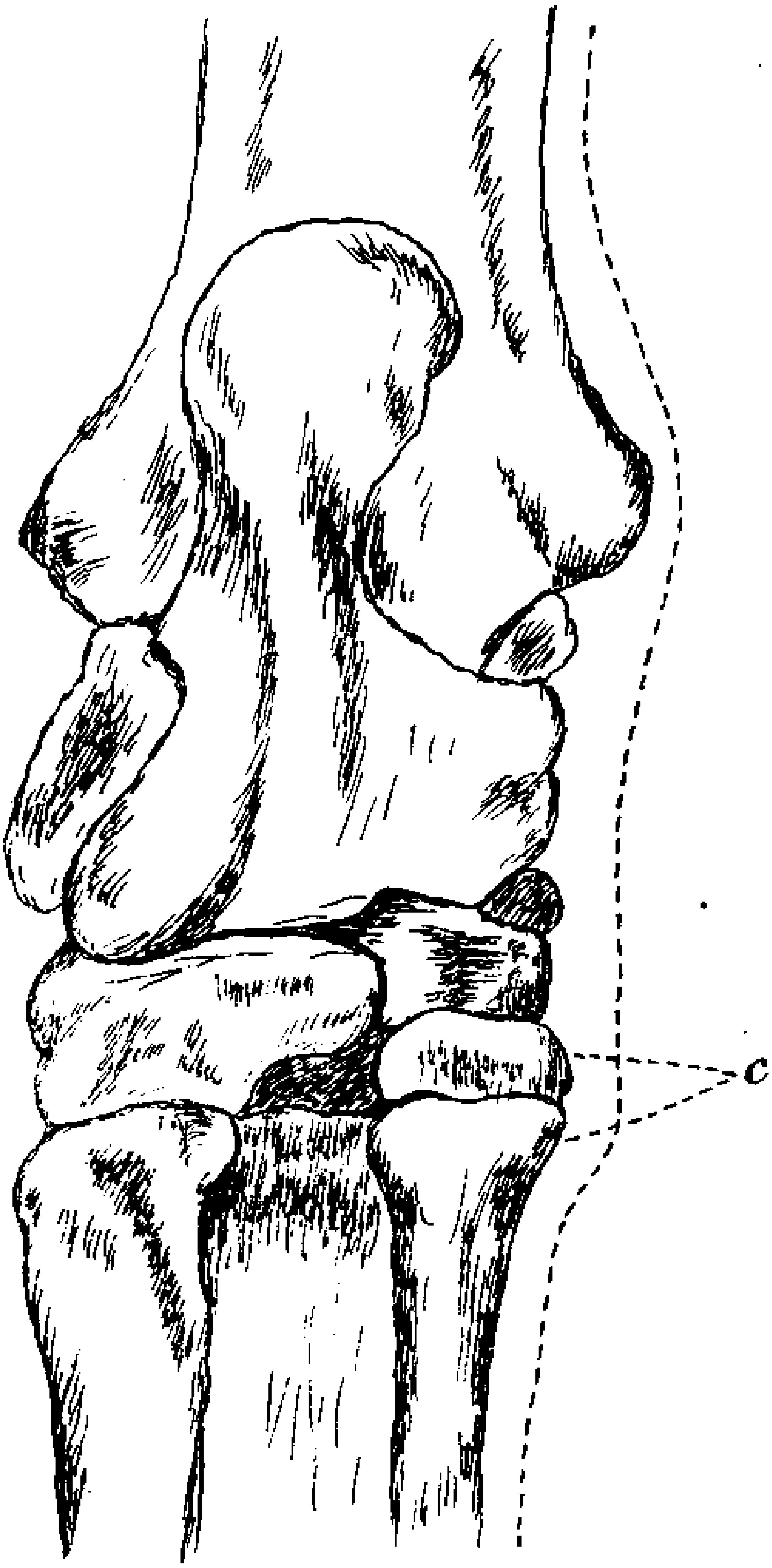
A sound Hock with the usual developements.

small.

PLATE VI.

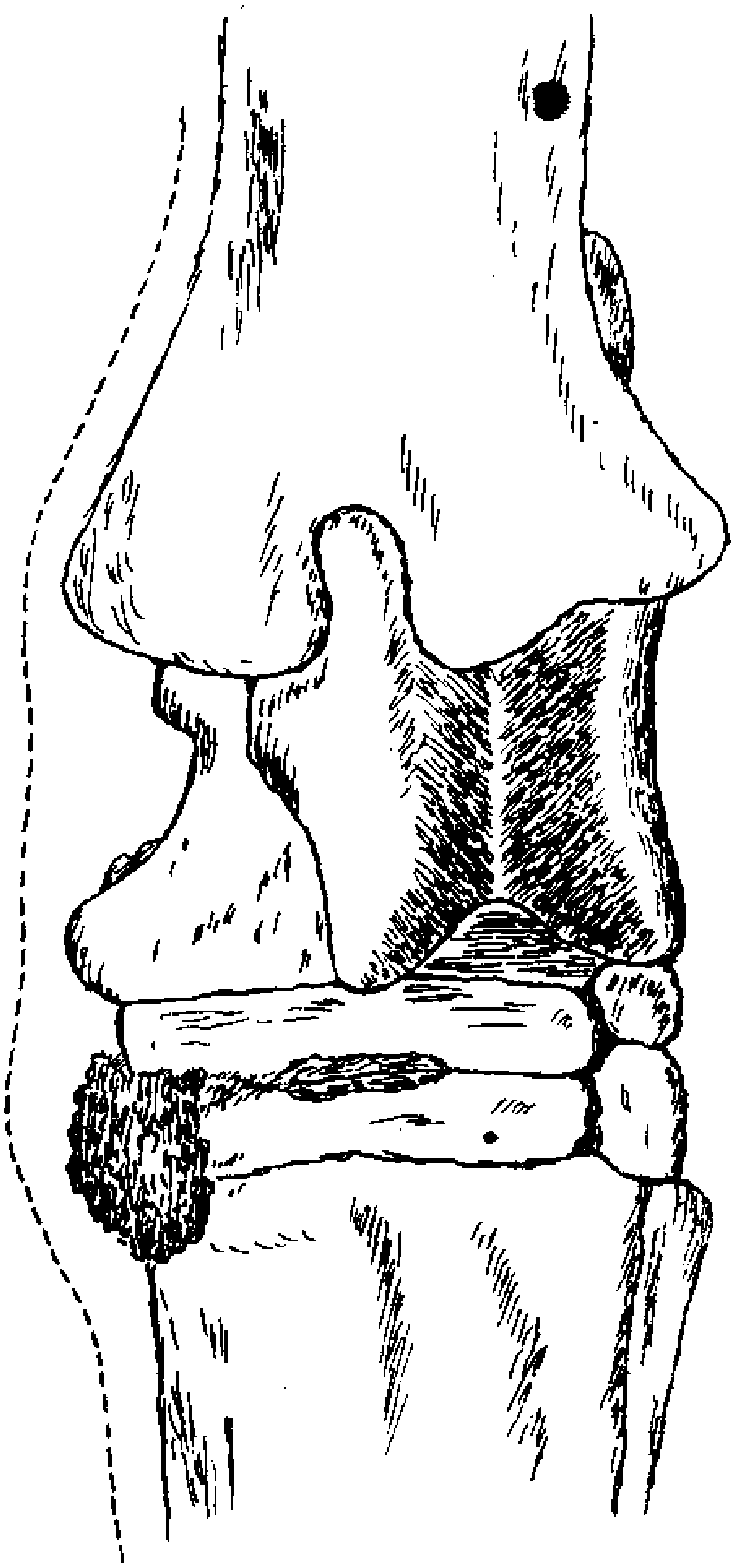


Posterior view of a sound Hock



Posterior view of a sound Hock, having a prominence of the Cuneiform parvum and internal small Metatarsal bone (C)

PLATE VIII.



Showing a Spavined Hock, with the Excostosis in a very frequent position.